PACIOLI 13

Microeconomic Data on Farm Diversification, Rural Businesses and Intra-generational Transfer

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Agricultural Economics Research Institute (LEI), The Hague

The Agricultural Economics Research Institute (LEI) is active in a wide array of research which can be classified into various domains. This report reflects research within the following domain:

- ☐ Statutory and service tasks
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- ☐ Natural resources and the environment
- ☐ Land and economics
- ☐ Chains
- ☐ Policy
- ☐ Institutions, people and perceptions
- ☑ Models and data

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The PACIOLI Network explores the need for and feasibility of innovation in farm accounting and its consequences for data gathering for policy analysis in Farm Accountancy Data Networks (FADNs). PACIOLI 13 was held in Hardingasete, near Bergen, Norway, in June 2005. The theme of the workshop focussed on farm diversification, rural business and intra-generational transfer of farms. This workshop report presents the papers.

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Contents

Page

Preface

Rural development policies invite farmers to start new businesses and to diversify their activities. The rationale behind this policy is that such innovation leads to improvements in income and in the end to a higher share of farms transferred to the next generation. For Farm Accountancy Data Networks (FADNs) such policies imply new challenges to come up with relevant data.

To exchange experiences in this domain the PACIOLI group yearly organises a workshop. In 2005 the group met in Hardingasete, a rural development site itself, in the neighbourhood of Bergen, Norway. This report contains the papers or presentations from the PACIOLI 13 day workshop, as well as the reports from the work group discussions.

We are indebted to our colleagues at NILF in Norway, and especially Torbjørn Haukas, Ane Lyng and Finn Andersen for all the support in organising a wonderful workshop. Besides the normal local organising work, this included an excellent hotel facility and a very interesting excursion on rural development and farming in the Norwegian context. In the Netherlands and on the spot Colinda Teeuwen-Vogelaar helped to prepare the workshop and once again Helga van der Kooij took care of the text processing for the publication.

We are happy that many colleagues in the PACIOLI network indicated that they would like to meet again in 2006. Check our website www.pacioli.org for upcoming details.

The managing director,

Prof. Dr. L.C. Zachariasse
Director General LEI B.V.

1. Introduction

1.1 The Pacioli network

Innovative ideas face many hurdles to become successful implementations. This is also true in farm accounting and in Farm Accountancy Data Networks (FADNs). Therefore it makes sense to bring together the 'change agents', the persons that have a personal drive to change the content of their work and their organisations. For farm accounting and policy supporting FADNs it is appropriate to do this in an international context: this creates possibilities to learn from each other. By bringing FADN managers and data users in micro economic research together, feed back is fostered.

It is with this background that the PACIOLI-network organises every year a workshop. This small but open network has become a breeding place for ideas on innovations and projects.

Pacioli was originally a Concerted Action in the EU's Third Framework Programme for Research and Technical Development (AIR3-CT94-2456). After completion of the contract with the PACIOLI-4 workshop, the partners decided to keep the network alive at their own costs.

1.2 Theme of PACIOLI 13

Farmers are reacting to rural development plans by diversifying from farming into other activities. These activities are partly farm related, partly not. The long term sustainability, also for the next generation, of such business models is still unclear. Government policies influence the diversification as well as its profitability and sustainability by agricultural and rural policy, by subsidies and tax breaks. Such policies ask for evaluation and therefore for micro economic data, which is a challenge for Farm Accountancy Data Networks.

This has been be the topic of the 13th Pacioli workshop. The Norwegian experience, where small and medium sized businesses on the farm are encouraged, seems to be of special relevance for other countries and the workshop explored if this is the case, including for countries in Eastern Europe where farming followed another historical path.

1.3 PACIOLI 13 programme

Sunday, 5 Juni 2005
17.00 Transport from Flesland Airport to Hardingasete (arrival Hardingasete 19.15)
19.15 Transport from Nordheimsund busstation to Hardingasete

20.00 Local drinks from Norway in the boathouse/brewery
21.00 Dinner

Monday, 6 June 2005

09.00 Welcome, introduction workshop program (Krijn Poppe)
09.15 Introduction to Norwegian agriculture and agricultural policy by Leif Forsell (director general in the Ministry of Agriculture and Food, former director NILF)
10.15 Coffee/tea
10.30 Introduction workshop participants

The Scandinavian rural business session
10.45 'Farm-based supplementary enterprises in the Norwegian Survey of Account Statistics'
(Torbjørn Haukås and Eva Øvren, NILF)
11.15 'Formation of total income of farmers in income statistics and FADN data - the case of Finland'
(Maija Puurunen, MTT Economic Research)
11.45 'Complementary activities related to FADN'
(Tomas Westling, Statistics Sweden)
12.30 Lunch
13.30 Workgoup session 1
'Identifying best practices from Scandanivia'

The organic session
15.00 'Organic Farming in FADNs - Issues and Analysis'
(Frank Offerman, FAL, EISfOM project)
15.45 'Organic farming in the NL compared to other countries'
(Krijn Poppe, Kees de Bont, LEI)

16.15 'On the development of the farm monitoring system in Macedonia'
(Mitko Kostov and Vesna Ilievska, National Extension Agency)
16.45 Workgroup session 2
'Improving FADNs with respect to organic farming'
18.00 Free for wandering in the area or bathing in the bath-tubes or in the fjord for the Vikings!
20.00 Dinner
Mr. Gunnar Dolve will join us for dinner. He is representing the local agricultural authorities in the municipality, and he is living a few hundred meters from Hardingasete. He will show some pictures and tell about activities and businesses in Kvam Commune.

Tuesday, 7 June 2005

The Typology Session

09.00 'The Contribution of Farm Typology to Farm Level Analysis of the Canadian Agricultural Sector'
(Verna Mitura, Agriculture and Agri-Food Canada)

09.30 'Developments in Indicators of Canadian Farm Family Well-being: The importance of household definition'
(Verna Mitura, Agriculture and Agri-Food Canada)

10.00 'Farm typology based on implied farm strategies'
(Krijn Poppe, Hennie van der Veen, Karel van Bommel, LEI)

10.30 Workgroup session 3
'Farm Typologies revisited: recommendations for future FADN typologies'

12.00 Lunch

The Weighting Session

13.00 'Calibration for improved weighting and bias analysis in FADN surveys'
(Beat Meijer, Bemepro)

13.30 'Non-response in the Dutch FADN: Qualitative reasons and quantitative impacts'
(Hans Vrolijk, LEI)

The Handbook on rural development session

14.00 'Handbook on income measurement of agricultural households - project by UNECE, FAO, OECD and ERS'
(Catherine Moreddu, OECD)

14.30 *Workgroup session 4*
'Comments on Handbook'

16.00 Excursion
(more details below)

Wednesday, 8 June 2005

The Succession Session

08.30 'Information System FADN Czech Republic'
(Michaela Lekesova and Martina Harvilikova, VUZE)

09.15 'Succession Plans of Farmers in Northern Germany'
(Hans-Hennig Sundermeier, LBV)

09.45 'Using ARMS for data on retirement plans'
(Paper Ashok Mishra, ERS / presentation Krijn)

10.15 Workgroup session 5
'Recommendations for FADNs on data gathering on future farmers'

11.00 Closing/follow-up
- Questions and answers
- wrapping up
- need for Pacioli 14?

12.00 Lunch
13.00 Bus leaving for the airport
14.45 Arrival Bergen airport Flesland

Excursion programme

16.00 Departure Hardingasete by boat
16.30 Visiting Hardanger fartøyvernsenter
18.00 Departure by boat to Fykse
18.30 Arrival Steinstø (Fykse) by boat
15 minutes to walk up to the farm (possible to get cartransport)
19.00 - Welcome drink, presentation of the farm and supplementary activities,
- Questions and answers, local music in the cave 'Døse'
- Dinner
23.00 Departure for Hardingasete by bus (arrival 23.45)

2. Farm-based supplementary enterprises in the Norwegian Survey of Account Statistics

Torbjørn Haukås[1] *& Eva Øvren*[2]

Abstracts

The Account Statistics in Norway started in 1911, and have always included total household economy. Since 1997 farm-based supplementary enterprises has been regarded separately. The authorities demand data from such enterprises in the survey. The Norwegian Agricultural Economics Research Institute (NILF) has defined farm-based supplementary enterprises as enterprises using the holding's resources of land, machinery, buildings or others. The farm-based supplementary enterprises include production of goods and services. There are problems connected to representation because the population of the survey is defined by the holding's agricultural production. Of the holdings in the survey have 45% farm-based supplementary enterprises, but to most of them these enterprises are not of great economic significance. There are differences between regions, and there is no significant increase in farm-based supplementary enterprises' share of total net income during the period from 1997 to 2003.

2.1 Account Statistics in Norway, a Brief History

The Royal Norwegian Society for Development started the Account Statistics in Norway in 1911. The purpose in 1911 was to educate the farmers in accounting and farm management and thereby increase food production and income for farm families. The Survey continued from 1947 in a newly established institution, The Norwegian Institute of Agricultural Economics. The aim was to have 1,000 participants in the survey, and this was reached about 1950. The Account Statistics these first years after World War II were meant to contribute to efficiency and increased production. The latest decades the purpose has mainly been to be an instrument for measuring the effectiveness of the agricultural policy, and to provide data to make comparisons to other national and international statistics possible and relevant, to provide material for further research and analysis, and contribute to advisory service and education.

Since the beginning the Account Statistics included the household's income from other sources than agriculture. The private consumption of the farm family has been calculated. Since 1964 a number of the participants (about 20%) also have provided separate account data concerning farm forestry. In addition to the results from the farm economy,

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the whole economic situation for the farm family including wages, pensions, dividends, interests, claims, debts, taxes and consumption of the farmers family, is registered and presented. The farm's family includes the farmer and his or her spouse and children below 17 years of age. Children over 17 years of age have their own tax return and is treated as hired labour.

Total net income is calculated as follows:

Net income agriculture
+ Net income forestry
+ Net income farm-based supplementary enterprises
+ Net income off-farm supplementary enterprises
+ Wages
+ Pensions
+ Dividend and interest income
+ Family labour on investment, imputed value
= Total income
- Interest paid
- Payments to previous owner
= Total net income

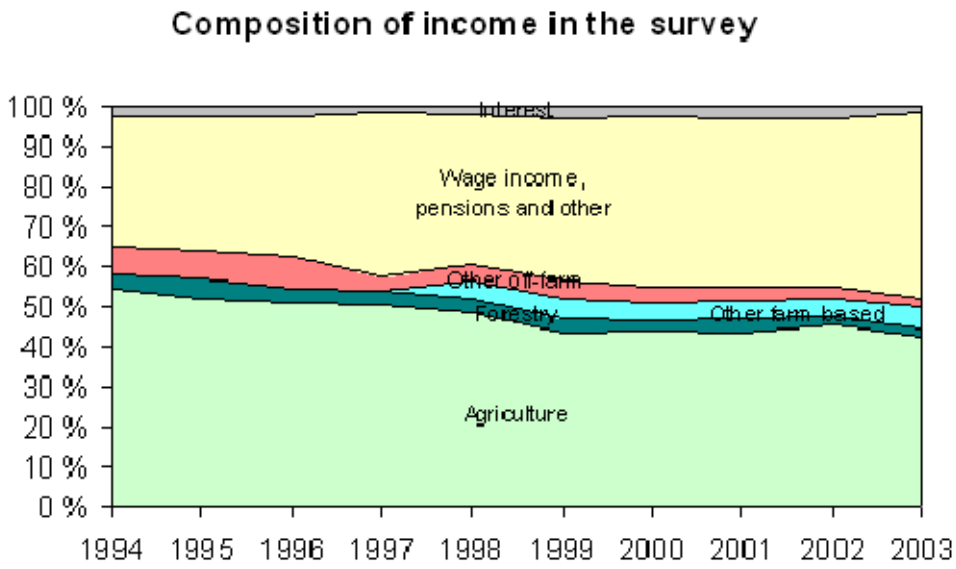

Figure 2.1 Composition of income. Average for all farms in the statistics
Source: Account results in agriculture and forestry 2003, NILF 2004.

Figure 2.1 shows that the share of total income from farm-based activities has been decreasing during the latest decade. Contribution from wages has increased, and is now as important to the average farm family income as the income from agriculture. The contribution from other activities including forestry has changed insignificant over the period.

From 1997, businesses besides agriculture and forestry are divided in farm-based supplementary enterprises based on the resources of the farm and off-farm supplementary enterprises without basis in agriculture or forestry (more on definitions below).

2.2 Agricultural policy and supplementary enterprises

The aims of the agricultural policy have been changing over the latest decades. Berkeley Hill[1] says:

> 'In Norway the broad agricultural policy aims relate to food security (such as approximate self-sufficiency in animal products) and to stabilise the population in rural areas, to which agriculture is seen as capable of making a major contribution. The income aim is for the farmer to have an economic and social standard of living equal to that of industrial workers. Legislation of 1965 stipulated that the income generated by a modern and rationally-managed farm that employed one annual worker had to be at least at the same level as the average wage income reached in rationally-managed industry. Agricultural commodity prices were to be adjusted with this in mind; legislation of 1975 set the target of parity by 1982. A resolution of 1976 expanded the basis of comparison to one of living standard, not just income.'

And:

> 'However, in a major revision of policy in 1992 the legislation of 1975 was repealed and replaced with a less committing objective - that farmers have to be provided with the potential for income and living standards corresponding with the remainder of the population. This was to be achieved through creating a 'robust agriculture', not a very precise term but interpreted as one that had a structure that enabled it to be more internationally competitive and less dependent on raised prices for its products. However, at the same time, the policy revisions recognised that farmers supply non-marked goods (environmental, cultural landscape, support of rural society, food security etc. for which payment should be made).'

The number of man-year in traditional agriculture has decreased and the prices of agricultural products have dropped relatively to other prices. The farmers have been told to produce other things than bulk commodities. Other enterprises than production of milk and meat have to stabilise the population in rural areas. The 'robust agriculture' could for instance include tourism and fur production (in the early nineties). Later on the farmers were encouraged to find niches for their production by processing local products. A large amount of grants are paid out to establish alternatives to traditional agricultural enterprises. The Ministry wish that the Account Statistics shall be able to tell how successful these transfers have been; how large the volume of different alternative productions are, how many are employed and how much they earn.

[1] Hill, Berkeley (2000): Farm Incomes, Wealth and Agricultural Policy. Third Edition, pp. 38-39.

2.3 Problems related to population

The extent of farm-based supplementary enterprises in the survey may be affected by the selection of farms for the Account Statistics. In the whole country there were about 58,000 holdings who applied for production subsidies in 2003, while the population of the survey is about 34,400 holdings. The reason for this big difference is that in the survey income from agriculture should be of *an essential volume*, defined as a total Standard Gross Margin (SGM) of at least 8 ESU (or about NOK 78,000 in 2003). Quite a lot of small holdings are outside the population of the survey. It is possible that small holdings have a higher share of farm-based supplementary enterprises than larger holdings to achieve sufficient total income for the family.

One of the main problems to get a representative sample in farm-based supplementary enterprises is that the holdings in the survey are chosen according to their agricultural production, mainly. Subsequently one tries to achieve a representative sample in the Farm Forestry survey where the population to some extent is defined in statistics. Farm-based supplementary enterprises and 'other enterprises' are a complex and heterogeneous group of enterprises, which there is no single statistic to describe. In many connections parts of what we call farm-based supplementary enterprises will be registered as agricultural or forestry enterprises. It is therefore difficult *to tell if* the representation of farm-based supplementary enterprises and other enterprises in the survey *is good enough*.

An other problem in connection with farming and supplementary enterprises is that those who succeed in their alternative businesses may quit farming or perhaps rent out the traditional activities. These families will drop out of the universe of the survey because it is the agricultural production that defines the population.

It is also difficult to separate the different enterprises in the account. Often it is not divided between agriculture and other enterprises in the tax accounts. It is therefore a time-consuming task and a great portion of uncertainty connected to the results for the single enterprise.

2.4 Definitions

Account Statistics in agriculture and forestry contains data from all kinds of business on the chosen holdings. From 1997, enterprises outside agriculture and forestry, but based on the resources of the farm, are registered separately. In the publication those are presented as 'farm-based supplementary enterprises'. Farm-based supplementary enterprises are defined in the survey as enterprises that use the holding's resources of land, machinery, buildings or other. Snow clearing by tractor, renting of housing that are parts of the holding, and different kinds of processing are examples of farm-based supplementary enterprises.

Besides, 'other supplementary enterprises', *businesses* not using the resources of the farm, are registered. Driving lumber truck or excavator and own practise as a doctor or adviser are examples.

2.5 Classification of farm-based supplementary enterprises

Farm-based supplementary enterprises are classified in the following categories:

- utilization of non-agricultural farm areas, like hunting and fishing, arrangements and services for cabins etcetera;
- production of goods, processing of own products from agriculture or forestry or other (examples: Making cheese, yoghurt, or other products from domestic animals, fish or game, chopping firewood and refining fruit, berries and herbs);
- contract work with farm machinery, means selling services done by own tractor or other machinery;
- tourism is selling activities and renting out cabins or rooms;
- houses and rooms for hire on more permanent basis;
- other services;
- not classified. Means that none of the other classes describe the business well. Often a combination of more than two of the others.

In addition the survey has combined types. To be classified with 'farm-based supplementary enterprises' the farm family must have worked at least 200 hours a year in the business, or the net income has to be at least NOK 10,000[1] (about 1,200 euro) or the assets of the enterprises must be at least NOK 100,000.

If farm-based supplementary enterprises should be registered as 'combined' type, every single enterprise has to have at least 50 man-hour family labour per year, 25% of the net income or 25% of the assets. If more than two enterprises fulfil these demands, the type of enterprise will be 'not classified'.

2.6 The frequency of different farm-based supplementary enterprises

In the Survey for 2003 farm-based supplementary enterprises are registered on 422 holdings, or 45% of the participants. Such enterprises are most frequent in the Lowlands in Eastern Norway where 58% of the participants have some kind of farm-based supplementary enterprises, and most rare in Northern Norway and Jæren with 28 and 23% respectively.

Table 2.1 shows that contract work with farm machinery is the most common farm-based supplementary enterprise in the survey. To many farmers it is easy to combine this enterprise with agriculture or forestry. Some farmers work with snow clearing, while others have equipment for baling and work with this also by neighbours. In addition working with farm machinery also is common in combination with other enterprises.

Rental housing is also widespread, especially in Eastern Norway. Production of goods is equally spread over the country. To some extent there are also farm-based supplementary enterprises on the 510 holdings in the Survey that by definition do not have such enterprises. The average net income from farm-based supplementary enterprise on these holdings was NOK 1,900.

[1] NOK 100 = 12.23 euro, April 2005.

Table 2.1 Survey holdings classified by types of farm-based supplementary enterprises Regions

Regions	Utilization of non-agricultural farm areas	Production of goods	Contract work with farm machinery	Tourism	Rental housing	Others	Not classified
Eastern Norway, Lowlands	3	4	24	1	30	17	32
Eastern Norway, 'other parts'	5	8	12	4	22	13	29
Jæren	1	1			5	3	
Agder/Rogaland, 'other parts'	1	6	13	2	5	15	6
Western Norway	3	5	30	5	12	8	7
Trøndelag, Lowlands	2	2	9	1	6	3	2
Trøndelag, 'other parts'	6	3	12		5	6	1
Northern Norway		6	7	1	8	5	5
All holdings	20	35	108	14	93	70	82

Source: Account results in agriculture and forestry 2003, NILF 2004.

2.7 Net income from farm-based supplementary enterprise

On many holdings net income from farm-based supplementary enterprise contribute significantly to the total income. On average for all participants with such enterprises the *net* income from those was NOK 49,200 in 2003. That was 9% of the total net income on these holdings.

Table 2.2 shows net income by different categories of farm-based supplementary enterprises. In some categories there are too few holdings to present results. In Eastern

Table 2.2 Net income. Average results originated from categories of farm-based supplementary enterprises. NOK

Regions	Utilization of non-agricultural farm areas	Production of goods	Contract work with farm machinery	Tourism	Rental housing	Others	Not classified
Eastern Norway, Lowlands	106,700	40,600	66,000	-	46,500	124,100	85,100
Eastern Norway, 'other parts'	58,400	41,700	36,800	50,500	32,800	60,100	30,300
Jæren		-	-		20,900	31,600	
Agder/Rogaland, 'other parts'	-	67,200	25,900	-	26,700	48,000	22,400
Western Norway	28,400	51,400	45,700	42,700	32,100	32,100	33,700
Trøndelag, Lowlands	-	-	32,200	-	35,400	54,700	-
Trøndelag, 'other parts'	96,500	30,600	22,100		48,300	87,700	-
Northern Norway		31,800	25,300	-	12,500	49,300	18,600
All holdings	66,600	47,800	41,100	36,800	35,400	70,000	56,300

Source: Account results in agriculture and forestry 2003, NILF 2004.

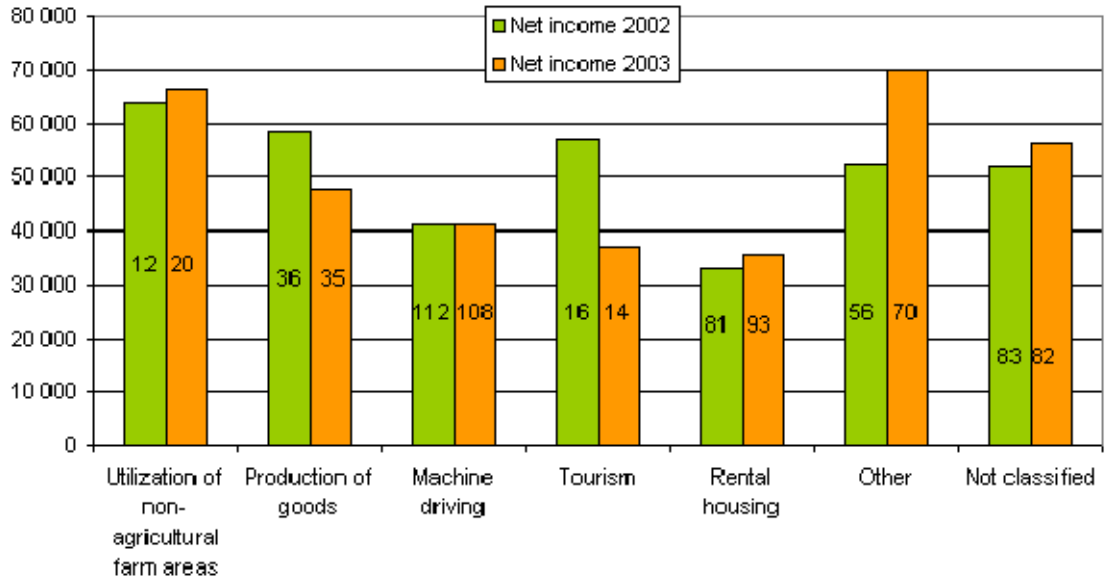

Figure 2.2 Net income from different farm-based supplementary enterprises in 2002 and 2003, NOK per holding with such activities. Number of observations
Source: Account results in agriculture and forestry 2003, NILF 2004.

Norway, Lowlands, the average net income from farm-based supplementary enterprises was NOK 75,000. This was 12% of the total income for these holdings. Only a few holdings have utilization of non-agricultural farm areas or production of goods, but in Eastern Norway and Jæren these enterprises mean quite a lot to some holdings.

In Western Norway the average net income from farm-based supplementary enterprises was NOK 40,000 in 2003, or 9% of the total net income. In Northern Norway farm-based supplementary enterprises have less economic importance to the participants in the Survey. The net income from such enterprises was on average NOK 25,000 for those who had such enterprises.

2.8 The importance of farm-based supplementary enterprises compared to total earnings

For all participants in the survey (932 holdings) the average net income from farm-based supplementary enterprises contributed a little more than 4% to the total family income in 2003 (table 2.3). The percentage varies by region and type of enterprise. The table shows most activity in Eastern Norway and least in Jæren. In Northern Norway farm-based supplementary enterprises have relatively little significance through out the whole period 1997-2003. The Survey does not show an increasing significance in farm-based supplementary enterprises during the period 1997-2003. One reason for this may be that the holdings in the Survey have large agricultural activity. There may not be time for or need

Table 2.3 Significance of farm-based supplementary enterprises. Net income from farm-based supplementary enterprises as percentage of total net income. All holdings in the Account Statistics

Regions	1997	1998	1999	2000	2001	2002	2003
Eastern Norway, Lowlands	4.7	5.4	7.1	5.9	6.1	5.7	6.7
Eastern Norway, 'other parts'	3.5	7.9	8.0	6.0	6.2	5.2	4.5
Jæren	0.5	1.6	3.6	2.8	2.5	0.9	1.4
Agder/Rogaland, 'other parts'	2.3	4.1	4.1	3.5	3.6	3.2	3.8
Western Norway	2.2	4.5	4.8	4.6	3.8	3.5	3.5
Trøndelag, Lowlands	0.9	2.8	2.6	2.6	2.3	2.0	3.2
Trøndelag, 'other parts'	2.2	4.6	4.9	5.1	4.3	3.7	5.3
Northern Norway	2.1	2.2	2.5	2.6	3.5	1.5	1.7
All holdings	2.9	4.9	5.5	4.7	4.6	3.8	4.3

Source: Account results in agriculture and forestry 2003, NILF 2004.

of supplementary enterprises on these holdings. However there is a small increase from 2002 till 2003, and in Trøndelag farm-based supplementary enterprises seems to increase.

2.9 Conclusions

- There are great demand for data for farm-based supplementary enterprises, and it is urgent to establish statistics on this topics.
- It is labour-intensive to separate farm-based supplementary enterprises from other activities in the Account Statistics.
- The population for the agricultural survey may not be the optimal one for gauging the importance of farm-based supplementary enterprises. There may be a need of an other universe.
- Farm-based supplementary enterprises have great economic significance to some holdings, but little significance for the average holding in the survey.
- There is no significant increase in farm-based supplementary enterprises' share of total net income from 1997 to 2003.
- Contract work with farm machinery is the most common farm-based supplementary enterprise.
- Utilization of non-agricultural farm areas gives the highest net income (few observations).

Literature

Hill, Berkeley, *Farm Incomes, Wealth and Agricultural Policy*. Third Edition, 2000.

Norwegian Agricultural Economics Reasearch Institute, *Account results in agriculture and forestry 2003,* 2004.

3. Comparability of the income concepts according to the agricultural statistics in Finland

Prof. Maija Puurunen[1]

Abstract

Different statistics on the income of farm families in Finland have been examined in the following from the point of view of the total income of farm family. The main statistics including the income data of farm families are the Agricultural Enterprise and Income Statistics (here AEIS) and results of the Finnish bookkeeping farms including the Farm Accountancy Data Network, as well as the Income Distribution Statistics (IDS). The AEIS and the IDS are run by Statistics Finland and they base on the taxation information. The farm bookkeeping with the Finnish FADN are produced by MTT Economic Research. All these statistics have different main goals. The AEIS cover large number of farms and with the data form the personal taxation these statistics produce an income concept of cash based total income. Population of the IDS cover all private households in the society, and the main income concept is disposable income which describes consuming possibilities of households. Results of the bookkeeping farms describe entrepreneurial income on an accural base and profitability of farms. During last few years the farm bookkeeping has been reformed to response better to the challenges in changing agriculture.

Keywords: Farm income, total income, disposable income, bookkeeping, FADN, taxation statistics, income distribution statistics

3.1 Introduction

Statistics and research on the income development and level of different groups of citizens have been prerequisites for promoting of welfare and equality in societies like the Nordic countries.

As it is well known, general salary negotiations can be very detailed and strict, and sometimes people are driven even to strikes for demands of some additional cents to their hourly wages. Still the people who use the same fridge in a household can have many different income sources. That forms a vast spectrum of income variety already among the salary earners and even much more variety among the entrepreneurs' households. During last few years e.g. in farmers' households in Finland, sources of the total income have been 38% of agriculture, 8% of forestry, 5% of other entrepreneurial activity, 35% of salaries, 6% of property income and 8% of pensions. Thus the agriculture may be a main work or a

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free time activity for people who can act on many lines of business. Level and distribution of the total income of persons, farms or households vary depending on the sources of data even on the Finnish farms, which have been objectives for the most thorough-going statistics and data gatherings in every aspect during last years.

Statistics on income and profitability of farm enterprises are needed for developing the agriculture and implementing the farm policy, whereas implementing of the rural policy and rural development require data about the socioeconomic activity and livelihood of rural people and about the economic success of rural enterprises. The common agricultural policy is changing towards more integrated development of rural areas. That brings new challenges to the statisticians to produce more qualified data sources and net works for monitoring of the change on the rural areas and welfare of citizens in different socioeconomic groups in addition to the agricultural statistics.

3.2 Income development of farm families according to different statistics in Finland

In Finland the central statistics for examining the income of farm population are the Agricultural Enterprise and Income Statistics (here AEIS), which are based on taxation data and inquiries; results of the bookkeeping farms in the Profitability Study of Agriculture, which include also the data for the FADN; and the Income Distribution Statistics (IDS), which produce the concept of disposable income of household and cover all population groups. The IDS are also based on the income data of taxation, even if these have been corrected through data from various registers and interviews, so that the income concepts response to the OECD's recommendation for income distribution statistics. The AEIS and the IDS are produced by the Statistics Finland, statistics on farm structure and agricultural aids by the Information Centre of the Ministry of Agriculture and Forestry, TIKE, and bookkeeping results and the Finnish FADN data (Farm Accountancy Data Network) by the MTT Economic Research (MTTL).

The statistics based on the taxation have a completion delay of one and a half year. At present, the latest publications of AEIS and IDS are from 2002. The latest FADN data in Finland is from the year 2003. According to the latest proposals the maximum delay for the FADN would be 13 months for the data of 2004 and 12 months for the data of 2005. Thus the FADN data of 2004 has to be delivered in January 2006 and the data of 2005 in December 2007 to the commission.

3.2.1 Taxation statistics

3.2.1.1 Concepts based on the taxation data of farms

The Agricultural Enterprise and Income Statistics (AEIS) is based on an extensive sample of about 9,000 farms (about 12% of the farm population), which makes a versatile classification of farms possible, especially as the sample is divided according to the farm size, production line and area. The statistics are compiled on tax forms of family farms' agriculture and forestry and farmer inquiry. In the income study of MTTL, the data from the register of personal taxation (PT) concerning the sample farms' farmer and spouse have

been added to the data of AEIS. The PT includes e.g. salaries, pensions and property income of all tax payers. According this AEIS+PT data in 2002 the population of farms owned by natural persons was 64,500 farms, which is nearly 90% of all farms; over 10% of farms are owned by the heirs and other taxation syndicates, whereas limited companies and such are still few in Finland.

The AEIS+PT data includes the cash based income from agriculture and forestry, and other taxable income of farmer and spouse. The statistics are based on the rules of taxation, which have not changed much during last years. All income concepts mean net income, i.e. costs due to the earning of the income have been reduced. The concepts formed by means of the AEIS+PT data are following:

Agricultural income + Income from forestry + other entrepreneurial income + wages and salaries
= Primary income
+ Property income = Factory income
+ Pensions = Total income
- Taxes = Total net income

The entrepreneurial income form agriculture has been called also agricultural income, and as in the FADN concepts farm income. However, in Finland the farm income doesn't include income from forestry. On the basis of the resulting income data, i.e. AEIS+PT, it is possible to achieve, roughly, factor income that is somehow in accordance with concepts of the Income Distribution Statistics (IDS). Still, the income data include only taxes from the income transfers paid and taxable pensions from the income transfers received. Even if the concept of disposable income cannot be completely achieved, the AEIS+PT form the most versatile and extensive data for examining income disparities within the farm population.

3.2.1.2 Some results of the taxation data of farms

During last ten years the real value of agricultural income on average has not changed in the whole, although the farm size has increased over one third from the year 1995. In 2002, which is the latest year in the taxation statistics, agricultural income on the farms over 2 ha field was in average 14,400 €/farm. Size of the average farm was about 30 ha field and 17 animal units. The level of total income of farmers has increased mainly by means of wages and salaries out side of the farm. Development of the total income of farmer and spouse in 1995-2004e in part time farms and full time farms has been presented in figure 3.1. For the inflation the data is presented in the level of year 2001 by means of the consumer price index.

In the figure 3.1 farms are grouped according to the income sources of farmer and spouse into the four groups: in the first group the share of agricultural income is under 25% of the total income, in the following groups 25-50%, 50-75% and in the group of full-time farmers over 75%. In the long run the share of full-time farms has decreased and part time farms increased. Due to the development of wages and salaries the level of total income has increased on the part time farms, but in the full time farms total income has varied on the same level, even though the average farm size has increased from 28 ha to over 41 ha per farm in that group. In 1998, 1999 and 2004 the weather conditions have been ex-

tremely bad for agriculture, which has been taken into consideration also in the estimation of income in 2004. Still the basic reasons for the poor income development of full time farms are decreasing producer prices and supports and increasing costs in agriculture. In spite of the investment supports and increase of the farm size, development of the productivity of farms hasn't been fast enough.

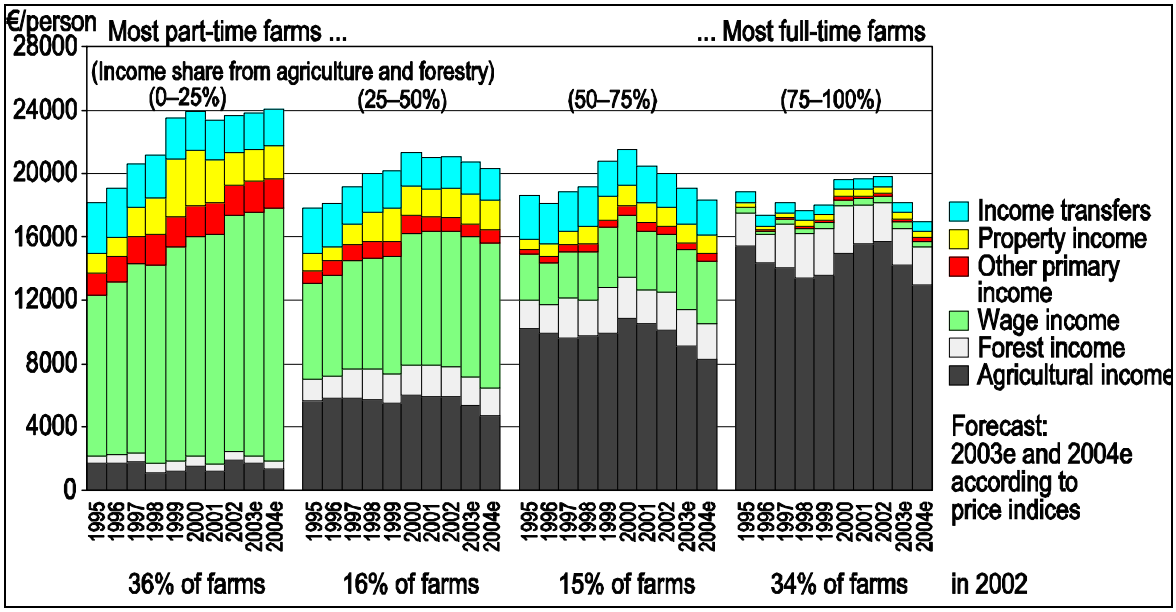

Figure 3.1 Total income of farmer and spouse (€/person) according to the income share of agriculture and forestry in 1995-2004e (in the level of 2001). On the most part-time farms the income share of agriculture and forestry is under 25% and on the most full-time farms over 75% of the total income of farmer and spouse

Sources: MTT and Statistics Finland.

Agricultural income indicates the compensation for the farm family's own labour input and own capital used in agriculture. According to the data of taxation it is not possible to separate these two elements from the agricultural income due to the lack of labour data and insufficient data of capital. That is why in the income studies of MTTL based on the taxation statistics (e.g. Väre 2000, 2003) the whole agricultural income per farmer and spouse has been compared with the salary income of industrial workers. Still farmers' agricultural income is much lower than the comparison income. In order to define part time and full time farmers more precisely and examine their income formation, some efforts to combine the data of the farm families' work input form the Agricultural Census and form the Farm Structure Surveys with the income data of farmers' taxation has been done (Seppälä 2004). Certain methodological problems have arisen form the way of classification of farmers, which will be solved in the Finnish Farm Structure Survey 2005 by asking the working time of members of farm families as number of work hours and not only as ticked appropriate cell.

3.2.2 Income distribution statistics vs. taxation statistics of farms

Uniform concepts for examining different income earner groups and their incomes from different sources have been developed in the international recommendation for income distribution statistics by United Nations from 1977 and later on reformed by the OECD. In Finland, as well as in other Nordic Countries, this international recommendation for statistics has been applied most completely in the Income Distribution Statistics, and as a background information in the Household Survey. Disposable income, which indicates the consumption potential of households, is the central concept for income distribution statistics. The following chart describes the formation of disposable income:

Entrepreneurial income	+ Wages and salaries	= Primary income
	+ Capital income	= Factor income
	+ Income transfers received - Income transfers paid	= Disposable income

Concept of disposable income is also used in the statistics produced by Eurostat´s initiative, the Income of the Agricultural Households Sector (IAHS), which were formerly known as the Total Income of Agriculture Households (TIAH) statistics. The objectives set by Eurostat for these statistics were not only monitoring the income changes, but also comparing the absolute income of farmers with that of other socio-professional groups on a unit basis (Hill 2000). For that the TIAH project had targets for the 'narrow' and 'broad' definitions for the farmer's households. The first mentioned definition concerns more full time farmers whereas the last mentioned approach includes all the households where any member of the household has some income from agriculture. Both of these groupings have been available e.g. in the Finnish Income Distribution Statistics (Hill 1995).

In the Finnish Income Distribution Statistics population of households was in 2002 total 2.397,500 and sample for the inquiry was 10,850, i.e. 0,45% of the population (Income Distribution Statistics 2002). The sample is divided only according to socioeconomic position and income class of the reference person. Half of the sample is changed every year so that the same household stays in the statistics maximum two years. Share of farmers in the sample has been added to 1,85% of the farmer population, but still there are some unconsistencies in the time series of farmers' income development, because the farm structure has not been taken into account in the sample e.g. as in the AEIS.

Both statistics base on the taxation data but in addition to that, agricultural income in the IDS includes some estimated items as rental value of own dwelling and consumption of own products. In the AEIS+PT data the unit is farmer and spouse instead of household or consumer unit, but on the most farms farmer and spouse are the only income earners concerning agricultural income. Disposable income per consumer unit in the IDS is more exact income concept than total income minus taxes per farmer and spouse in the AEIS+PT data, but the unconsistency of agricultural income disturbs the time series also in the concept of disposable income.

Development of the disposable income per consumer unit have been presented in the figure 3.2 according to the IDS in the households of agricultural employers, other employers and salary earners. The numbers of the figure are nominal values. In 2002 in the IDS the changed OECD scale has been applied in the number of consumer units, where the first person in the household is one, but the second is 0,5 and not 0,7 as in the earlier scale. Also

the net income per farmer and spouse according to the AEIS+PT has been presented in the figure. In addition to the before mentioned differences between the statistics, in the income of the AEIS+PT only pensions and paid taxes has been possible to take into account in the income transfers.

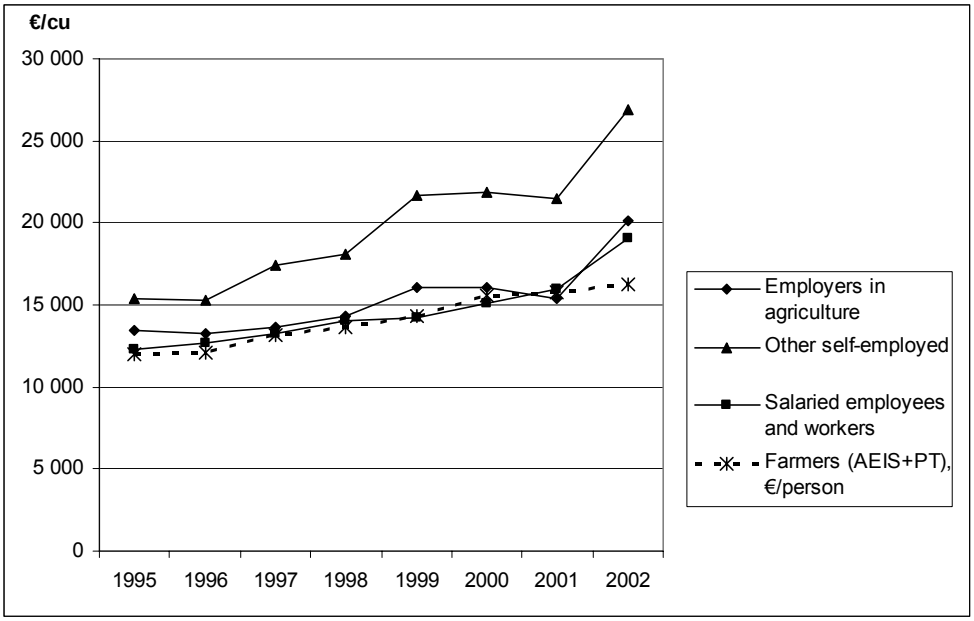

Figure 3.2 Disposable income per consumer unit (€/cu) according to the IDS in the households of agricultural employers, other employers and salary earners, and net income per farmer and spouse (€/person) according to the AEIS+PT in 1995-2002

Source: MTT and Statistics Finland.

3.2.3 Bookkeeping farms and the FADN

3.2.3.1 Bookkeeping farms as a source of income data

The most perfect income data of agriculture originate form the profitability bookkeeping of farms. In Finland the farm bookkeeping bases on a sample of about 1,000 farms according to the EU typology and it is co-ordinated by the MTTL. In addition to the profitability figures of agriculture and other enterpreneurial activity on the farm the bookkeeping produces the data concerning agriculture and horticulture for the needs of the FADN (appendix 1). Population of the FADN farms covers 60% of the total number of farms, but 90% of the value of agricultural and horticultural production. Thus on the rest of the farms, 40%, which produces only 10% of the gross product, other sources of livelihood are more important. In addition to the farms specialised in agriculture and horticulture as well as organic production, the bookkeeping includes also farms of diversified production (small rural enterprises e.g. farm tourism etcetera) and reindeer farms for the national needs. Now, some interest has risen also form the horse industry, because it is quite remarkable, growing field of activities.

During last few years the farm bookkeeping has been fundamentally reformed to produce results from agriculture, forestry and one other entrepreneurial activity on the accrual base in addition to the cash based wage income and other incomes of the farm family. Farm property has been evaluated and former per cent based depreciation (still used in farm taxation) has been changed for a planned depreciation system. The FADN data expected by the EU forms one part of the data collected and processed for national purposes. Compared with the bookkeeping data, which describes bigger and more full time farms (over 8 esus, i.e. grain farm about 20 ha), the AEIS+PT covers also the small farms (over 2 ha field). The sample in both statistics bases on the farm register of TIKE, but the FADN uses farm grouping according to the EU typology and the AEIS uses the farm grouping according to field hectares.

Results of the bookkeeping are calculated on the accrual base whereas the AEIS is cash based, which means more fundamental differences between the statistics. In principle, the bookkeeping data is originally cash based, and corrected then with trade receivables and payables, changes in stock values, timing of the production subsidies and adding the investment subsidies, and other items transferable over the break of accounting period. In cash based accounts a farmer can level off yearly variation of income by selling products or buying production inputs in the end of the accounting year. In cash based taxation a farmer can choose the size of depreciation e.g. for machines between 0-25% of diminishing balance of the value of machines and also by means of this he can smooth the yearly variation of the taxable income. In the FADN the fixed assets are valued according to their current values and adjusted to the general price level changes, while in the taxation only purchasing expenditures are used. In the Finnish FADN depreciation according to plan have been applied from the year 1998; e.g. for the machines the rate of depreciation can vary between 12-22% depending on the machine and its operation time and so stated depreciation time period (Ala-Orvola 1998). In the bookkeeping investment subsidies are included both in gross return and depreciations, and spread over the lifetime of investment. Contrary to the cash based accounts valuation of stores and changes in the store values are also essential in the accounts made on the accrual basis.

The bookkeeping produces separately entrepreneurial income for agriculture, horticulture, forestry and other entrepreneurial activity on the farm for the national needs, but for the FADN only income of agriculture and horticulture is needed. Because in the taxation the forestry has formed a separate income source, in the bookkeeping the cash based forestry income has been always treated apart from the agricultural income. The bookkeeping includes also work hours of farm family and paid workers as well as data for the balance sheet of farm. Thus in addition to the income studies, it is possible to examine profitability of entrepreneurial activity by means of the bookkeeping data. The balance sheet expresses amount of total capital and debts in agriculture, which are necessary for the studies on solvency and profitability of a farm among the other items. During last few years e.g. the share of net worth in the total capital has stayed as high as 70-75% (Tauriainen, 2005).

Except the reform of depreciation there were changes in the wage claim of farm family in 2001. In the beginning of 2005 a system for producing forecasting results of independent bookkeping farms was ready and it produced predictions for the years 2004 and 2005 on the base of the results of the accounting year 2003. The latest development

target is the entrepreneurial income of forestry, formation of which has been changed from the cash base to the accrual base. In the near future the forest income will express the growth of forest. Still the timber selling on the farm will be asked and used in the yearly dating of the growth figures of forest. Detailed information concerning the structure of forests is needed for the base of the forest income calculation, and that is why only such bookkeeping farms which have a dated forest plan including the information needed from different forest areas can produce the needed data on the accrual base in addition to the cash based data from the taxation. Still there is a problem in valuation of the forest for the yearly changes in the prices of timber.

The bookkeeping includes very detailed income items for the entrepreneurial activity of farms, but it does not include salaries outside of the farm earned by the farm family. Neither does it include capital income or income transfers received or paid. Thus, except the entrepreneurial income of a farm the bookkeeping does not include the items needed for the primary income or disposable income. In Finland the bookkeeping of agriculture and horticulture has been developed especially for describing farms' profitability, and during last years also other entrepreneurial activities of the farm family have been taken into the statistics. Because there are two different statistics for describing the total income of farm families, there is no need to take additional income items to the bookkeeping, instead of that it is more useful to continue development of the entrepreneurial activities in the bookkeeping statistics (Discussions with Latukka 2005, MTT Economic Research).

3.2.3.2 Some results of the bookkeeping farms

MTT Economic Research published results of the FADN farms in 2003 during the early sprig of 2005 on the home pages of the MTT Agrifood Research Finland (http://www.mtt.fi/kirjanpitotilat.html). In 2003 family farm income (i.e. entrepreneurial income from agriculture) was on average about 22,600 €/farm. As the agricultural income in 2002 according to the AEIS was 14,400 €/farm the farm income according to the FADN was 24,000 €/farm. These results are not comparable mainly because of the following reasons:

1. the FADN represents bigger farms than the AEIS; average farm size in 2002 in the FADN was ab. 44 ha field and 25 animal units (farms over 8 esu) and in the AEIS ab. 30 ha field and 17 animal units (farms over 2 ha field);
2. the sample is smaller in the FADN than in the AEIS;
3. the FADN is compiled on the accrual basis and the AEIS on the cash basis;
4. basis and method for the depreciation are different;
5. original bookkeeping data for the FADN is more exact than data for the taxation based AEIS.

In the profitability bookkeeping the total output+subsidies is compared with all the costs due to the production, including the wage claim of farm family and the interest claim for net worth of the entrepreneurial activity on the farm among the other cost items (figure 3.3). In 2003 the wage claim was 11,30 €/hour and the interest claim 5%. If the output+subsidies is bigger than the total cost the farm is profitable and if not the farm has produced some loss. In 2003 production costs were so much bigger than the out-

put+subsidies that the family farm income covered only half of the wage and interest claim of farm family, i.e. so called profitability coefficient was 0,5. That is why the farm family got only 5,65 €/hour as labour income and 2,5% interest for the net worth (Tauriainen, 2005).

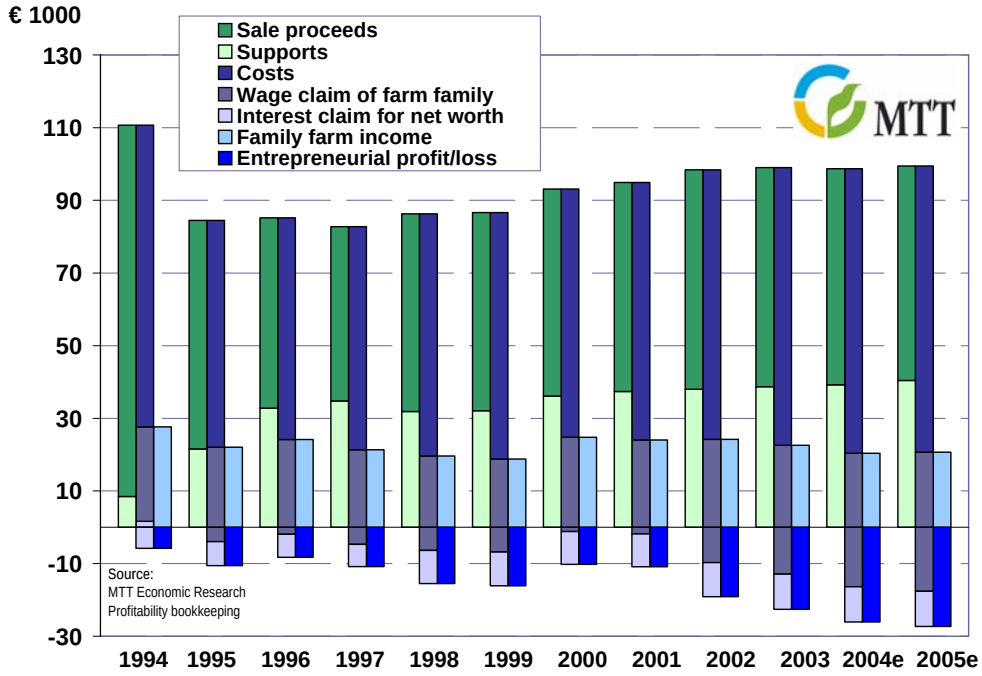

Figure 3.3 Gross return, production costs, family farm income and entrepreneurial profit/loss on book-keeping farms in 1994-2003 and 2004-2005 estimated
Source: MTT, results of the FADN farms.

According to the estimate made for the individual farms the profitability of agriculture has continued decreasing; in 2004e the family farm income covered 44% of the labour income and interest claim of farm family and if the year 2005 will be similar as 2003, the profitability coefficient has been estimated to be 0,43. The estimate bases on the farm structure in 2003. The low profitability coefficient in 2004 results from the rainy weather conditions and decreased yields in plant production and increased costs. In 2005 so far the main reasons for the lowering of the profitability coefficient have been decreased producer prices. Profitability has bee best in the meet production, but during the last years it has lowered to the level of other production lines, and lowest the profitability has been in grain production (figure 3.4).

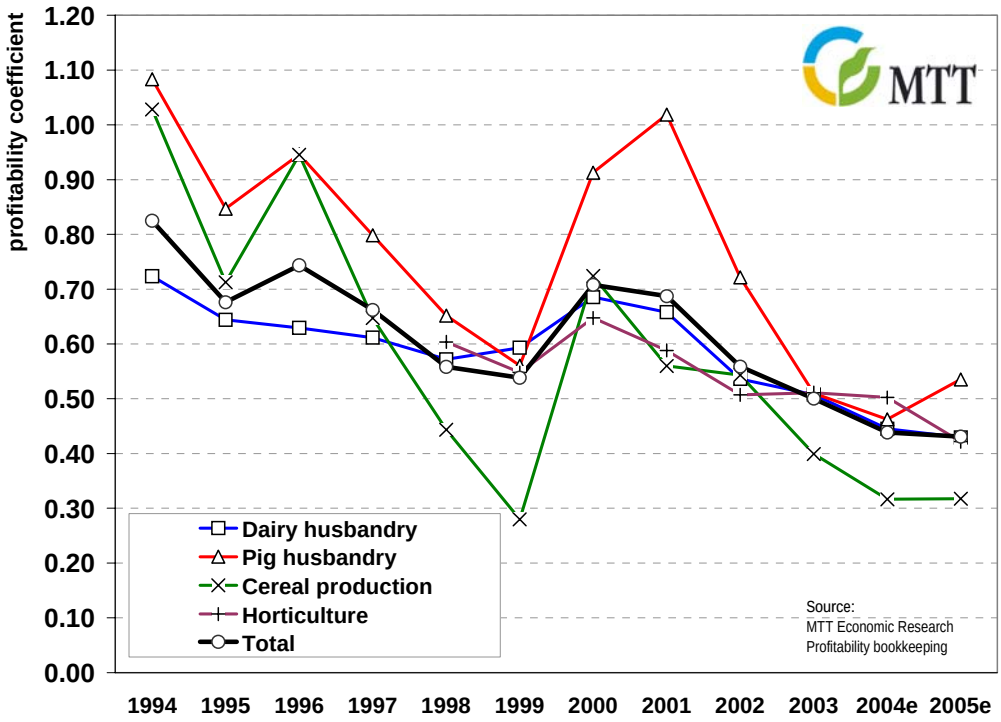

Figure 3.4 Development of the profitability coefficient (family farm income per sum of the wage and interest claim of farm family) on bookkeeping farms

Source: MTT, results of the FADN farms.

3.3 Conclusions

3.3.1 The FADN and the profitability bookkeeping

The bookkeeping results describe income and profitability of the entrepreneurial activities on farm level and also future developments in the statistics will focus mainly on these categories. In addition to the economic results of agriculture and horticulture available form the FADN (Appendix 1) the Finnish bookkeeping produces data also for the profitability and solvency of a farm. The FADN has its main targets in planning and follow up of effects of the EU's agricultural policy and as such it ought to be developed also in the future. Even if the concepts of the FADN are in principle the same in the different member countries, in practice there are differences in implementation of the accountancy, and many difficulties arise in comparing the results even between the Nordic countries (Forsman 2005). That is why more efforts are needed for the harmonizing of data collection and processing the data.

From the point of view of income studies Farm income per Annual Family Farm Work Unit indicates the income level of farm families, but it doesn't tell much about the resources by means of which the income has been reached. Thus the results of labour intensive and capital intensive farms are not comparable with each others. The profit and loss indicates the profitability of an enterprise but by means of the mere profit/loss accounts it

is difficult to compare the results of farms of different size or production lines. In Finland the traditional profitability coefficient used in the bookkeeping for national purposes has proved to be a very practical indicator for profitability of different farms and it includes a lot of necessary information needed e.g. in the studies on the economic success of the farms in different production lines and size as well as effects of different farm policies. But for that the FADN ought to include proper balance sheets with reformed values of agricultural property.

Even if the accrual based results are the main goal in the Finnish farm bookkeeping also the cash based results have found their uses: On the farm level, with the cash based results farmers can compare the bookkeeping results with their tax forms and they can get more information about liquidity of the farm. The cash based bookkeeping results are also useful in the developing of the bookkeeping system, because with them it is possible to produce a more exact areal pressing for the sample of bookkeeping farms by means of the vast taxation data of the AEIS. On the farms the same data as farmers give for the taxation is used also for the bookkeeping (Discussions with Latukka, 2005).

3.3.2 Statistics based on the taxation

The Agricultural Enterprise and Income Statistics (AEIS) are going to be chanced to cover the whole farm population. That will probably not change the results much, because the existing sample of the AEIS is quite big already now, but the reform will give new possibilities to combine the data from different sources. Because the register of personal taxation (PT) covers already the whole population, it will be possible to combine the labour input data from the Farm Structure Surveys (FSS) with the income data of the AEIS+PT. The combined data make it possible to grope farms on many ways to part time and full time farms and examine e.g. cash based primary income per farm families' labour input. Already now the combination has been possible with the Farm Census 2000 and for the big samples there will be a lot of common sample farms in the AEIS and the FSS. In the income studies (e.g. Seppälä 2004) problems have arisen from the way the labour input has been asked in the FSS, but in the 2005 survey the labour input will be asked also as work hours. Still the changes made by the tax authorities into the taxation system and tax forms are always problematic for the statisticians; even now Statistics Finland has to supplement the AEIS with farmer enquiries because of the reduction of specifications on tax forms some years ago.

Income Distribution Statistics (IDS) have very detailed income concepts and in Finland they are only statistics which produce the concept of Disposable income and thus information about different socio-economic groups and their consuming possibilities in the society. Division of the sample of the statistics bases on the socio-economic position of a reference person, which is problematic for the farm sturcture and farmer's income. For the international comparison of income level of different population groups in the EU the work started in the TIAH project (Hill, 1995) has been very valuable. Also the European Audit Office has paid attention to the fact that Eurostat has not enough tools for following the differences in the living standard of households in the EU (e.g. Kirsch & Joret, OECD workshop 29.4.2004 in Paris). In addition to the general information about the changes of income level and composition of it in different socio-economic groups in the society, sta-

tistics like the IDS would have much use in designing of the rural policy and evaluating of effects of the development programmes for rural areas.

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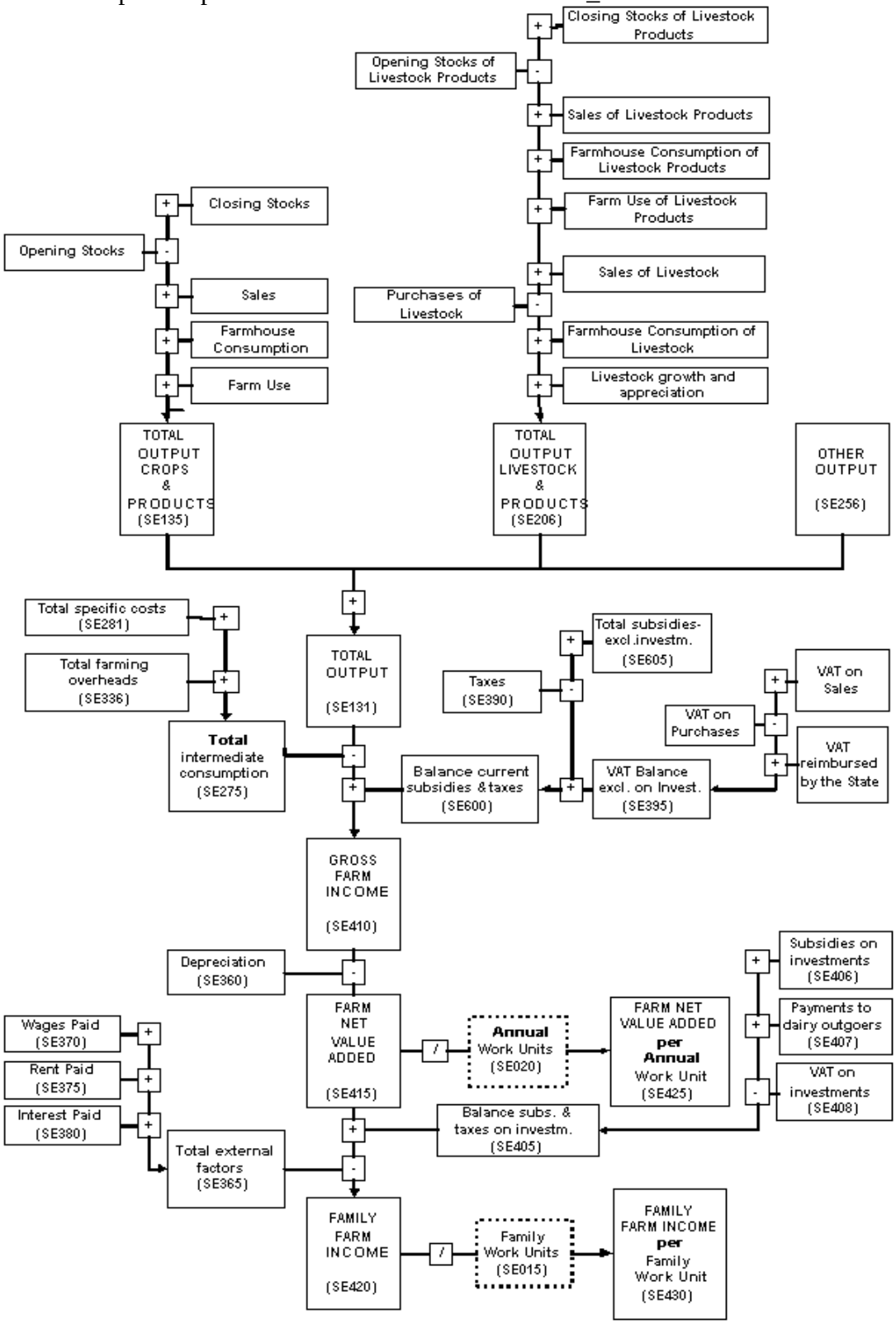
Appendix 1. Income concepts of the Farm Accountancy Data Network
Source: http://europa.eu.int/comm/atrculture/rica/index_en.cfm



4. Complementary activities in agriculture related to FADN

Tomas Westling and Ann-Marie Karlsson[1]

4.1 Background

Incomes from other sources than agriculture are an important part of the incomes of the agricultural households in Sweden. The objective for this paper is to review the importance of complementary activities and in more detail study the complementary activities in FADN. Furthermore the objective is also to find methods to improve the quality of the FADN-data regarding activities close to agriculture and the total incomes for the household.

For tax-purposes incomes are divided into three types in Sweden; incomes from business, incomes from employment and incomes from capital. Incomes from agriculture are included in incomes from business. However in incomes from business, other business-activities could also be included for example incomes from forestry or from other business activities not related to agriculture.

In this paper there will first be an overview of the importance of different types of incomes. Incomes from business will be thoroughly studied with the help of national FADN-data and the Farm register.

4.2 Incomes in the agricultural households

The average household income has been calculated for farmers in the Farm register. The average household income before tax-free positive transfers and taxes was for all agricultural households SEK 313,900 in year 2002. The household income after transfers amounted to SEK 225,400. Households in which the farmer was 65 years or older had the lowest average income both before transfers (SEK 229,100) and after transfers (SEK 168,300) (SCB, 2004; J02 SM0401).

In table 4.1 the figures for year 2001 and 2002 are shown. As can be seen from the figure the incomes from business are low in relation to the incomes from employment for the agricultural households.

Incomes from employment are important for the agricultural households. However when the size of the farm measured in arable land increases the importance of incomes from business increases. When different types of farms are studied incomes from business are most important for dairy farms while incomes from business are less important for farms with arable land without animals (SCB, 2004; J02 SM0401).

[1] Statistics Sweden.

This section shows that incomes from employment are an important complementary source of income for the agricultural household. Incomes from business are however interesting and we will go on and study the importance of the receipts and working hours for different business activities and specifically the importance of complementary business activities in the agriculture.

Table 4.1 Different types of income for agricultural households

Type of income	Amount year 2002		Amount year 2001	
Business	SEK	52,400	SEK	51,200
Employment	SEK	246,100	SEK	235,200
Capital	SEK	19,700	SEK	22,900
General deductions	SEK	-4,300	SEK	-4,300
Incomes before transfers	SEK	313,900	SEK	306,200
Postive transfers	SEK	11,900	SEK	11,400
Negative transfers (taxes)	SEK	-100,300	SEK	-101,600
Income after transfers	SEK	225,400	SEK	216,000

SCB, 2004; J02 SM0401.

4.3 Complementary business activities in Swedish agriculture

In this section complementary business-activities are studied. The complementary activities are discussed by:

- a special survey regarding complementary activities 2002;
- a merge between the farms in FADN and the survey regarding employment related to the national farm register from the year 2003. The merge makes it possible to compare the answers given in the survey regarding complementary activities and the results from the national FADN;
- information from the national Swedish additions to FADN and the FADN-material.

4.3.1 Survey of complementary activities in Swedish farms 2002

In order to study the importance of complementary activities in Sweden a special survey was carried out by Statistics Sweden in November 2002.

About 20,000 farms were included in the sample. The Swedish farm registry from 1999 was used as a frame. Complementary activities were defined as 'Other activities than agriculture which are of importance for the incomes and working situation at the farm'. Forestry and employment outside the farm were not included in the definition of complementary activities. The aim of the survey was not to study economical variables for example incomes. The questions asked in the survey were about:

- what kind of complementary activities are done at the farm, if any;
- the number of working hours put into complementary activities;
- who carries out the activites.

Main results from the survey

- The estimation of the total number of farms involved in some kind of complementary activity was approximately 20,000 farms which is about 25% of all swedish farms.
- The most common activities were:
  - snow clearing;
  - other contract work such as road work, working for other farmers etcetera;
  - selling products from the own farm.
- Other activities reported were such as tourism, letting out rooms and handicraft.
- About 60% of the farmers who had any complementary activity reported less then 450 workinghours/year which is about a quarter of a full-time work. About 10% of the farmers had activities corresponding to 1-2 full time workers.
- About 70% of the work on complementary activities was done by the farmer him/herself.
- There were some concern about overestimated results due to non-response bias.

4.3.2 Complementary activities in the employment survey

In 2003 the Swedish Board of Agriculture, as a part of collecting data for the farm register, made a sample survey about employment in the Swedish agriculture. There were about 32,000 farmers included in the sample. The sampling frame was the Swedish farm register 2002. One of the questions was about complementary activities in the agriculture. Specifically, what was asked about, were if the farm had any activity in:

- tourism, accommodation and other leisure activities;
- handicraft;
- processing of farm products;
- wood processing (e.g. sawing etcetera);
- aqua culture;
- renewable energy production;
- contractual work (using equipment of the holding);
- other.

By merging data from the employment survey onto the Swedish FADN-population and view the sample as selected from the Swedish FADN-population we can get estimates on the number of farmers involved in complementary activities in the FADN-population. Almost the whole Swedish FADN-population is included the sample (table 4.2).

Below estimates of the total number of different activities carried out by farmers in the Swedish FADN-population are presented. If a farmer has more than one activity he/she is included in several rows in the figure below. Table 4.3 shows that contractual work is the most common type of complementary activity.

Table 4.2 The Swedish FADN-population 2003 (EU-typology 2003)

Type of farming	OTE	ESU size class	Number of selected holdings	Number of holdings in the population	Number of holdings in the employment survey 2003
Cereals	13	100-	9	281	281
		40-100	25	1,221	1,214
		16-40	53	3,011	2,436
		8-16	42	3,081	1,669
General cropping	14, 60	100-	34	704	695
		40-100	42	1,453	1,291
		16-40	45	1,881	1,268
		8-16	20	1,978	909
Dairying	41	8-16	19	248	78
	41	100-	75	2,283	2,095
	41 Region 710	40-100	69	1,930	1,339
		16-40	24	537	275
	41 Region 720	40-100	76	2,048	1,396
		16-40	33	821	348
	41 Region 730	40-100	30	876	555
		16-40	32	448	191
Drystock	42-44	100-	0	38	38
		40-100	13	185	171
		16-40	37	1,001	717
		8-16	47	2,128	1,113
Pigs	501	100-	25	241	224
		40-100	28	191	139
		16-40	22	151	72
		8-16	5	42	13
Mixed	7+8	100-	19	473	471
		40-100	41	837	736
		16-40	32	1,214	901
		8-16	25	1,250	707
Other groups	1 - 8	over 8	0	821	600
	1 - 8	under 8	0	36,517	10,710

Table 4.3 Estimates of number of farms with different complementary activity in FADN as indicated in the employment survey

	FADN total	FADN %
Tourism etc.	1,023	3
Handicraft	179	1
Processing of farm products	471	2
Wood processing	351	1
Aqua culture	66	0
Energy production	220	1
Contractual work	3,009	10
Other	944	3

Table 4.4 Percentage of farmers in FADN, who in the employment survey indicated any complementary activities

Type of farming	OTE	ESU size class	Number of farmers with any complementary activity	Number of farmers in the population	Percentage of farmers with any complementary activity
Cereals	13	100-	9	281	281
Cereals	13	100-	58	281	21
		40-100	345	1,221	28
		16-40	645	3,011	21
		8-16	410	3,081	13
General cropping	14, 60	100-	160	704	23
		40-100	326	1,453	22
		16-40	328	1,881	17
		8-16	255	1,978	13
Dairying	41	8-16	10	248	4
	41	100-	317	2,283	14
	41 Region 710	40-100	236	1,930	12
		16-40	37	537	7
	41 Region 720	40-100	298	2,048	15
		16-40	90	821	11
	41 Region 730	40-100	137	876	16
		16-40	52	448	12
Drystock	42-44	100-	6	38	16
		40-100	41	185	22
		16-40	246	1,001	25
		8-16	411	2,128	19
Pigs	501	100-	27	241	11
		40-100	16	191	9
		16-40	10	151	7
		8-16	3	42	8
Mixed	7+8	100-	79	473	17
		40-100	158	837	19
		16-40	261	1,214	22
		8-16	203	1,250	16
Total FADN-pop			5,167	30,552	17
Other groups	1 - 8	over 8	99	821	12
	1 - 8	under 8	3,972	36,517	11
Total FADN-pop + Other groups			9,237	67,890	14

The estimate of the total number of farmers for each stratum in the Swedish FADN population who have any complementary activity is presented in table 4.4. The table shows that the type groups cereals, general cropping and drystock has the highest share of farmers that work with complementary activities. The typegroup with the lowest share of complementary activities is pigs.

4.3.3 Income and labour input in the Swedish FADN for different activities

Forestry and Agriculture are integrated in Sweden. About 75% of the Agricultural holdings in the Farm register also have forestland. About 10% of the agricultural holdings have more then 100 ha of forestland. The share of agricultural holdings that have forestland is highest in the north of Sweden and lowest on the plains in the south of Sweden (SCB, 2000).

Table 4.5 Total receipts in agriculture, forestry and other activities in 2003. Average per holding

	Total receipts per farm			Percent		
	agriculture	forestry	other business-activities	agriculture	forestry	other business-activities
Region 1						
Cereals 800-1599	506,700	15,600	74,800	85	3	13
Cereals 1600-3199	1,224,100	21,700	38,600	95	2	3
Dairying 1600-3199	555,300	8,300	0	99	1	0
Dairying 3200-5599	1,325,200	20,700	8,400	98	2	1
Region 2						
Dairying 1600-3199	583,700	119,800	4,200	82	17	1
Dairying 3200-5599	1,317,300	83,100	0	94	6	0
Region 3						
Dairying 1600-3199	745,400	65,600	19,200	90	8	2
Sweden						
Dairying 1600-3199	625,600	77,200	7,800	88	11	1
Dairying 3200-5599	1,327,600	59,900	27,400	94	4	2
Dairying 5600-	3,960,500	111,200	57,700	96	3	1
Drystock 800-3199	451,600	76,000	9,300	84	14	2
Pigs 1600-5599	1,552,700	44,800	16,500	96	3	1

Table 4.5 gives a few results on total receipts per holding from the Swedish FADN2003. The table shows receipts from agriculture, forestry and other business activities not included in agriculture for different subgroups by Swedish typology.

Table 4.5 shows that forestry is most important in region 2 and in region 3 in Sweden. Forestry is also important for farmers in the typegroup drystock. For the typegroup cereal, forestry is not so important instead other business activities is more influential especially for the smaller farmers.

Table 4.6 shows the working hours in agriculture forestry and other business activities. The table show the same results as table 4.5. The share of the total working hours in forestry is lower than the share of the total receipts from forestry. One possible explanation is that forestry is commonly sold as standing timber.

Table 4.6 Working hours in agriculture, forestry and other activities in 2003. Average per holding

	Working hours			Percent		
	agriculture	forestry	other business-activities	agriculture	forestry	other business-activities
Region 1						
Cereals 800-1599	1,300	63	127	87	4	9
Cereals 1600-3199	2,100	84	78	93	4	3
Dairying 1600-3199	3,300	112	0	97	3	0
Dairying 3200-5599	4,400	91	34	97	2	1
Region 2						
Dairying 1600-3199	3,400	323	20	91	9	1
Dairying 3200-5599	4,200	204	0	95	5	0
Region 3						
Dairying 1600-3199	3,300	206	16	94	6	0
Sweden						
Dairying 1600-3199	3,300	238	13	93	7	0
Dairying 3200-5599	4,300	147	30	96	3	1
Dairying 5600-	7,900	104	23	98	1	0
Drystock 800-3199	2,100	177	67	90	8	3
Pigs 1600-5599	3,000	57	28	97	2	1

Table 4.7 Receipts and working hours from complementary activity in the Swedish farm economics survey 2003. Average per holding

	Receipts from agriculture			Working hours		
	agri-culture	where of contract work included in agriculture	where of other activities included in agriculture	agri-culture	where of contract work included in agriculture	where of other activities included in agriculture
Region 1						
Cereals 800-1599	506,700	43,400	13,400	1,300	93	59
Cereals 1600-3199	1,224,100	80,360	38,900	2,100	147	149
Dairying 1600-3199	555,300	4,084	100	3,300	12	1
Dairying 3200-5599	1,325,200	15,615	15,800	4,400	40	11
Region 2						
Dairying 1600-3199	583,700	11,112	26,900	3,400	30	142
Dairying 3200-5599	1,317,300	29,651	3,400	4,200	74	10
Region 3						
Dairying 1600-3199	745,400	11,331	1,000	3,300	31	9
Sweden						
Dairying 1600-3199	625,600	9,275	11,600	3,300	25	62
Dairying 3200-5599	1,327,600	21,398	7,300	4,300	54	9
Dairying 5600-	3,960,500	74,790	37,200	7,900	159	135
Drystock 800-3199	451,600	31,262	22,800	2,100	89	117
Pigs 1600-5599	1,552,700	61,593	13,500	3,000	164	29

Table 4.7 shows receipts from complementary activities that are included in FADN. This means that the costs for the complementary activities can not be separated from the costs for agriculture and that the extent of the activity is small for each farm. The receipts and working hours for contract work and other activities are possible to detect in the Swedish FADN. Since contract work is the most common complementary activity it is separately presented.

In table 4.7 it is shown that contractual work as well as other activities are most common in the typegroups cereal and drystock.

4.4 Conclusions

In this paper we have investigated how common it is with complementary business activities on Swedish farms. In the paper, both studies presented show similar results. About 15 to 25% of the Swedish farmers have some sort of complementary business activity. The most common activity, forestry excluded, is contract work.

The receipts from forestry are not higher than 10% of the total receipts in the Swedish FADN in any of the presented typegroups. The receipts from forestry are most important in region 2 and 3. The receipts from other business activities are highest in the typegroups cereals and drystock, but they are generally low.

Complementary activities that are of small extent for each farm are included in agriculture in FADN, but are presented separately in the Swedish FADN. However these activities seems to have a fairly limited importance for the receipts.

It is also important to have in mind that businessrelated incomes are only one part of the total incomes for the agricultural households. Incomes from employment are the most important one. A study of incomes in agricultural households in the Swedish FADN-population is planned for later.

5. Organic Farming in FADNs - Issues and Analysis

Dr. Frank Offermann[1] and Dr. Nic Lampkin[2]

Abstract

The paper reviews issues of identification, representation and farm type and size definition of organic farming in farm accountancy data networks (FADNs), and discusses aspects of selecting appropriate conventional reference farms for comparisons. The paper concludes that the two key areas which need to be addressed in the short term, in order to make EU-FADN a useful, ongoing source of reliable data on organic farming's financial performance, are a) the identification of holdings and main enterprises and b) the sampling framework, with organic management introduced as a stratification criterion and appropriate modifications made to sample weightings. An analysis of the EU FADN shows that in the year 2000 organic farms received 20% more payments per hectare from the Common Agricultural Policy than conventional farms. This is due to significantly higher payments from the agri-environmental programmes and Less Favoured Area payments, which more than compensated for the fact that organic farms received approximately 18% fewer direct payments per hectare from the Common Market Organisations than comparable conventional farms. The analysis showed that on average, organic and comparable conventional farms achieved similar incomes. However, the variability in labour income is high in both the organic and the conventional farm samples.

5.1 Introduction

Organic farming in the European Union has grown from less than 1 million ha in 1994 to more than 5 million ha in 2003, and now accounts for more than 4% of EU agricultural land. Organic farming supplies a market worth more than 10 billion Euro in the EU and more than 25 billion Euro globally. The EU spends more than 700 million Euro annually supporting the organic sector, primarily for environmental and rural development objectives. The scale of the sector is now such that there is an urgent need for more detailed market information at all levels from production to consumption, and in particular financial data from organic farms to enable good farm business decision making and appropriate policy formation, including in particular the setting of payment rates for organic farming agri-environment schemes. The need for better statistical information is recognised as one of the key actions in the European Action Plan for Organic Food and Farming, published by the EU Commission in June 2004

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(http://europa.eu.int/comm/agriculture/qual/organic/plan/index_en.htm). The options for delivering better quality data have been examined closely in a number of recent and ongoing projects, in particularly the European Information System for Organic Markets Concerted Action (www.eisfom.org; Recke et al., 2004), the TAPAS review conducted by LEI (Bont et al., 2005) and the development of the IRENA Indicator 5.2 (see below). This paper sets out potential and the case for action to be taken to make changes to the EU-FADN system in order to meet the policy and market aspirations for the organic sector.

5.2 Organic farming in FADN's: Issues

5.2.1 Identification

Date of introduction and design of an identifier variable for organic farms depend on the FADN system. In some countries, organic farms can be identified in the respective national FADN for many years (e.g. Austria, Denmark, Germany, Switzerland). On a European level however, an identifier variable for organic holdings was only introduced in 2000/01 by Commission Regulation 1122/2000. Since the accounting year had started in almost all member states when the respective regulation entered into force, organic farms can be identified in only 10 (11) member states in 2000/2001 (2001/2002). Since 2002/2003, organic farms are identified and represented in the EU FADN in all member states with the exception of Ireland. Due to the often small number of organic farm accounts (table 5.1), meaningful analysis is still restricted to a few countries and farm types.

Table 5.1 Representation of organic farms in the EU FADN 2002

	BEL	DAN	DEU	ELL	ESP	FRA	IRE	ITA	LUX	NED	OST	POR	SUO	SVE	UKI	EU15
Field crops		*19*	*75*	3	*122*	11	.	*116*	1	*19*	*28*	9	13	9		*425*
Horticulture			10		4	6	.	2		5		2	1		2	*32*
Wine			5			8	.	*17*			6	2				*38*
Perm. crops			4	9	*26*	2	.	*76*			3	6				*126*
Milk	11	*42*	*74*		2	14	.	*90*	1	*22*	*176*		*19*	*25*	13	*489*
Grazing livestock	7	2	*18*		1	12	.	*291*	2	1	*52*	9	*15*	13	*16*	*439*
Granivores	1		1			1	.	1			1		1	1		7
Mixed	2	11	*67*			13	.	*73*	2	2	*22*	2	8	12	3	*217*
All fully organic	*21*	*74*	*254*	12	*155*	*67*	.	*666*	6	*49*	*288*	*30*	*57*	*60*	*34*	*1,773*
In conversion or partially organic	6	6	*42*	13	*247*	*96*	.	*164*	5	*76*	*19*	9	4	*116*	*49*	*852*

Samples with at least 15 farms are highlighted by bold figures.
Source: FADN-EU-GB AGRI/G.3.

The identification of organic farms is not straightforward. First of all, it is important how the question is asked. 'Is the holding organic?' leaves it open to non-organic holdings self-identifying themselves. Preferable are formulations like 'Is the holding, or part of it (if so how many ha) certified as organic in accordance with national and EU law?'.

An example of the potential complexity is provided by the design of the identifier variable in the Italian FADN, which differentiates six values to describe the organic status:

- partially organic - converting;
- partially organic - partly converted, partly converting;
- partially organic - converted;
- fully organic, converting;
- fully organic - partly converted, partly converting;
- fully organic - converted.

In the EU FADN the respective variable indicates whether the holding/land area is either a) fully organic or b) in-conversion or part conventional/part organic. However in the latter case, the indicator does not give indications as to the proportion of the holding that is managed organically and there are significant variations in how this is implemented nationally.

In future, it would be desirable for EU-FADN to differentiate fully organic, in-conversion to fully organic, and partially organic farms. For partially organic farms, information on the crop area and livestock enterprises managed organically should be included to allow these farms to be used in income comparisons.

Converting to fully organic (i.e. converting in one step, so that although in conversion, all land and enterprises are being managed to organic standards) could technically use the same code as fully organic if the start and finish years of conversion are recorded. A code system such as 1 for organic, 10 for first year (0 because it still has conventional status in certification terms), 11 for second year and 12 for third year conversion (the latter applying to holdings with perennial crops) might be easier to implement than recording dates.

The difficulty comes with the partially organic holdings that might be converting in stages to wholly organic or be part organic part conventional or a mixture. In such cases it would be necessary to identify the total land area registered as organic or in-conversion so that the proportion of the whole holding managed organically or in-conversion can be calculated. This proportion can then be used as a classification factor, for example including holdings that are >70% organic land in with other organic holdings. Main enterprises to be identified as organic in this context could include cereals (as a group or wheat if this is not possible), beans/peas, potatoes, olives, vines, dairy, beef, sheep, pigs, poultry. In the UK the collection system has now extended to much more enterprise data and an organic identifier for all enterprises is being discussed.

5.2.2 Representation

For FADN, sample farms are selected according to a selection plan that guarantees its overall representativeness, based on a stratification of the universe. The stratification criteria depend on the FADN system but usually include region, economic size and type of

farming, which also form the basis for the EU FADN. Individual weights are calculated for each farm in the sample by dividing the number of farms in the stratification cell of the field of observations by the number of farms in the corresponding cell in the sample. However, with the exception of the Danish national FADN, there is no specific methodology in place to ensure that any organic sample thus derived is representative of organic farms overall. This represents a problem especially in countries where organic holdings represent only a small proportion of farms. Therefore, generally no extrapolation of FADN information to all organic farms in the sector can be done, and aggregation has to be based on simple averages rather than weighted averages.

Approaches to improve the representativeness of results can for example comprise requiring to include a minimum numbers of organic farms in the FADN sample (in total or by farm type) or recalculating weights using ex-post stratification, as is done in the Netherlands (Bont et al., 2005). Individual national solutions to increase representativeness of organic farms however can currently lead to conflicts with the uniform calculation of weights in the EU FADN. In future, EU-FADN should consider the possibility of organic management as a stratification criterion and should make weighting criteria more flexible so that more organic farms from national databases can be included in the EU-FADN database.[1] Farm structural survey (FSS) results would need to distinguish organic farms by type and size, though open questions on type and size definition still need to be clarified (see chapter 2.3). This can also be achieved if the administrative (certification data) with sufficient detail on crop areas and livestock numbers can be used to classify the organic holdings by farm type and size. However, certification data does not normally include the conventional part of mixed status holdings (conversely, given current methodology, the FSS cannot distinguish the conventional and organic elements on mixed status holding and therefore may overstate the organic situation). To account for the fact that the number of organic farms in some areas is still very small, it could suffice to require only member states with a certain minimum percentage of organic farms to add strata for organic farms for their FADN survey, and concentrate on the most important farm types.

5.2.3 Farm type and size definitions

Within FADN, types of farming are defined on the basis of the contributions of the different lines of production to the total standard gross margin (SGM), which is also used to define economic farm size. As separate SGMs for organic farming are not available, farm type and size for organic farms currently are based on conventional SGMs. This may lead to a misclassification, as levels of inputs and outputs and prices for organic activities generally differ from conventional ones. The extent of this problem is yet unclear. Porskrog et al. (2003) calculated differentiated SGMs for two crop and two livestock activities in Denmark, showing that SGMs for organic farming were in all cases higher than the respective conventional ones. However, Bont et al. (2005, p. 52) see little hope 'that (all) Member Countries will present specific, separate SGM for organic farming', and suggest to invite Member states to do calculations for a selected activity like dairy cows as an example. This

[1] A study analysing options for a more flexible weighting schemes in the EU FADN has recently been launched by DG AGRI (D'Avino 2004).

would allow an assessment of whether there really is a significant difference between organic and conventional SGMs. However, if SGM values differ only because of different prices, and these are not reliably obtained by organic producers in many countries, it would not be sensible to create a new SGM framework based on these. In our view, it seems rational to continue with the current system for now and review it when there really is a substantial and comprehensive database of organic holdings in FADN.

5.2.4 Comparisons to conventional farming

Research and policy questions in the area of organic farming often are of the type: What (if any) is the difference in profits/prices/payments depending on whether a farm is managed organically or conventionally? Is the impact of a policy change on farms depending on the management system? Different approaches exist to answer these questions (Offermann & Nieberg, 2000), the most common of which is to compare the data of organic farms to those of a conventional reference group. However, it is not sufficient simply to compare the average for the organic farms with the average for all farms in the FADN sample, as the composition in terms of type, size and locality may be very different. Rather, it requires the identification of suitable conventional farms and it is necessary to ensure that any data used is genuinely comparable (Lampkin 1994; Offermann & Nieberg, 2000).

What does 'comparable' mean ? Generally speaking, conventional farms are comparable if they have similar production possibilities as the organic farm, in terms of both natural environment and resource endowment. There are several problems which can arise when using this approach (compare Lampkin, 1994, Nieberg & Offermann, 2003), and which can have a significant influence on the results of the comparisons. E.g., the choice of variables for the selection of comparable conventional farms has to be restricted to 'non-system determined' factors, so that farms are similar in terms of production potential or resource endowment (land quality/area, farm type, region, capital infrastructure (e.g. buildings, quotas) as well as management capacities of the producer. Other inputs, including labour, need not be similar as they will reflect production intensity and how the fixed resources are used for specific activities to achieve the desired objectives. The restriction to 'non-system determined' factors often severely limits the number of indicators that can be used, especially as information on natural production conditions in farm accounts is generally sparse.

The approaches adopted for selecting comparable conventional farms in existing studies differ, both with respect to choice of selection variables as well as with respect to matching procedures applied, so that results between studies and countries cannot be easily compared. As a consequence, within the EU research project EU-CEE-OFP (http://www.irs.aber.ac.uk/EUCEEOFP/index.html), guidelines for harmonisation of income comparisons of organic and conventional farms have been developed, which can serve as a basis for a 'code of good practice' (Offermann, 2004). The preferred approach is to select a group of similar conventional farms to compare with each individual organic farm, so that the impact of differences in management ability can be minimised. The selection of the comparison groups should be done by selecting groups of farms that fall within a specified range of values for defined parameters so that comparable conventional farms should:

- have similar natural production conditions;
- be located in the same 'region';
- have a similar endowment with production factors;
- be of a similar farm type.

The exact specification of the variables can depend on national circumstances and data availability.

It should be noted that if organic farms present a sufficiently high number of all farms in a region, the comparison procedure may become easier. Specific matching may not be needed anymore, as the organic farms can simply be compared to all conventional farms of similar farm type and same size in the respective region.

5.2.5 Time series

Time series of the development of the income of organic farms in comparison to conventional farming are often more valuable the single-year snapshots. Such time series can in principal be compiled on the basis of the published information from national yearbooks for several countries (e.g. Germany, Denmark, Switzerland, Austria, see Offermann, 2004, for results). However, these time series face two problems. First, it has to be taken into account that FADN samples are changing over the years, with some farms being dropped from the survey and others being taken up. This issues is aggravated for organic farming, as the number of organic farms has increased, and often still is increasing, quite significantly. The development of average results therefore provides an insight into the average income situation of the current sample - changes in the situation however cannot easily be attributed to changes in the political or market environment as they could also be due to the changes in the samples. The second problem is that often the criteria and procedure to select the conventional reference groups has changed (repeatedly) during time, making intertemporal comparisons difficult.

These problems can be overcome using time series of identical farms. Within the project EU-CEEOFP, an analysis of a set of farms identical over time has been done for Austria, Germany, Italy and Switzerland (Nieberg et al., 2005).

5.2.6 Income coverage

A well known-problem of income analysis with FADN-like systems is the difficulty of accounting for off-farm income or income from on-farm non-agricultural activities. The FSS results do indicate that this issue could be even more relevant for organic farms, as organic farms are more often involved in non-agricultural gainful activities than conventional farms, especially with respect to on-farm retailing, processing and tourism (Häring et al., 2004).

5.3 Organic farming in the EU FADN: Analysis of direct payments and profits

5.3.1 Introduction

In recent years, organic farming issues have increasingly been highlighted in general European agricultural policy topics. The need for well-founded fact based analyses often stood in contrast to the incomplete data availability in many areas of organic farming (Recke et al., 2004). The identification of organic farms in the EU FADN from 2000 onwards finally offered the possibility providing respective analyses on farm level on a European scale, and was explored in two studies:

- the Commission DG Environment in 2002 commissioned a study to analyse the effects of the CAP on environmentally friendly farming systems, using organic farming as an example (Häring et al., 2004). Within this study, the analysis of direct payments using the EU FADN database constituted an important part. As the FADN year 2000 was used, the analysis was restricted to the 10 countries where fully organic farms could be identified;
- the European Environmental Agency commissioned a study on the IRENA[1] indicator 5.2 'Organic prices and incomes'. Within these studies, the EU FADN was used for an analysis of income indicators.

For both studies, information for comparable conventional farms was extracted from the EU FADN. For each organic farm in the sample, conventional reference farms were selected base on the selection variable in table 5.2.

Excerpts from the results of these studies will be presented in the following sections.

5.3.2 Direct payments

An analysis of FADN data for the year 2000 showed that in ten EU countries analysed, organic farms in the EU in total received 20% more CAP payments per hectare than conventional farms (figure 5.1). This results from the fact that, on average, organic farms

Table 5.2 Variable specifications for selecting comparable conventional farms

Area	Indicator specification	Code in EU-FADN
A	1. same (not) less favoured (mountain) area status	A39
	2. same altitude zone	A41
B	same FADN region (NUTS 1)	A1
C	1. similar size in hectare (+/- 20% or +/- 10 ha)	SE025
	2. similar milk production (+/- 20% or +/- 25t)	K162QQ + K163QQ
	3. similar sugar beet production (+/-20% or +/- 100t)	K131QQ
D	8 farm type categories based on principal farm type classification	TF8

[1] 35 Indicators Reporting on the integration of Environmental concerns into Agricultural policy (IRENA) are defined by COM (2001) 144 final and have been operationalised as methodology/data and indicator fact sheets (see http://webpubs.eea.eu.int/content/irena/index.htm for details). Two of these (nos. 5 & 7) address organic farming specifically.

received more than 70% higher payments from the agri-environmental and LFA area payments than conventional farms. Organic horticultural and arable farms benefit most from agri-environmental and LFA payments compared to similar conventional farms, permanent crop and grazing livestock farms benefit least.

However, organic farms on average received approximately 18% fewer direct payments per hectare from the Common Market Organisations (CMO) than comparable conventional farms. The differentiation of the payments by CMO help explain the reasons for this difference (table 5.3). Organic farms received significantly fewer compensatory area payments for cereals, oilseeds and protein crops (COP payments), as these are made for certain crops only of which organic farms often grow less due to the need for a broader crop rotation and the use of leys for fertility building. Specifically the eligibility of maize for silage for these payments in many countries favours conventional farming, as this crop is often not well suited for organic farming systems and is substituted by (arable) grass silage, which is eligible for COP payments only in Sweden and Finland. Total livestock related payments per hectare were higher on organic farms than in the conventional reference group. However, significant differences with respect to the different categories of payments exists. The conventional reference group received more special premiums for bulls as well as slaughter premiums, as stocking rates are higher and fattening periods shorter. Organic farms profited from the second premium for steers, but these payments

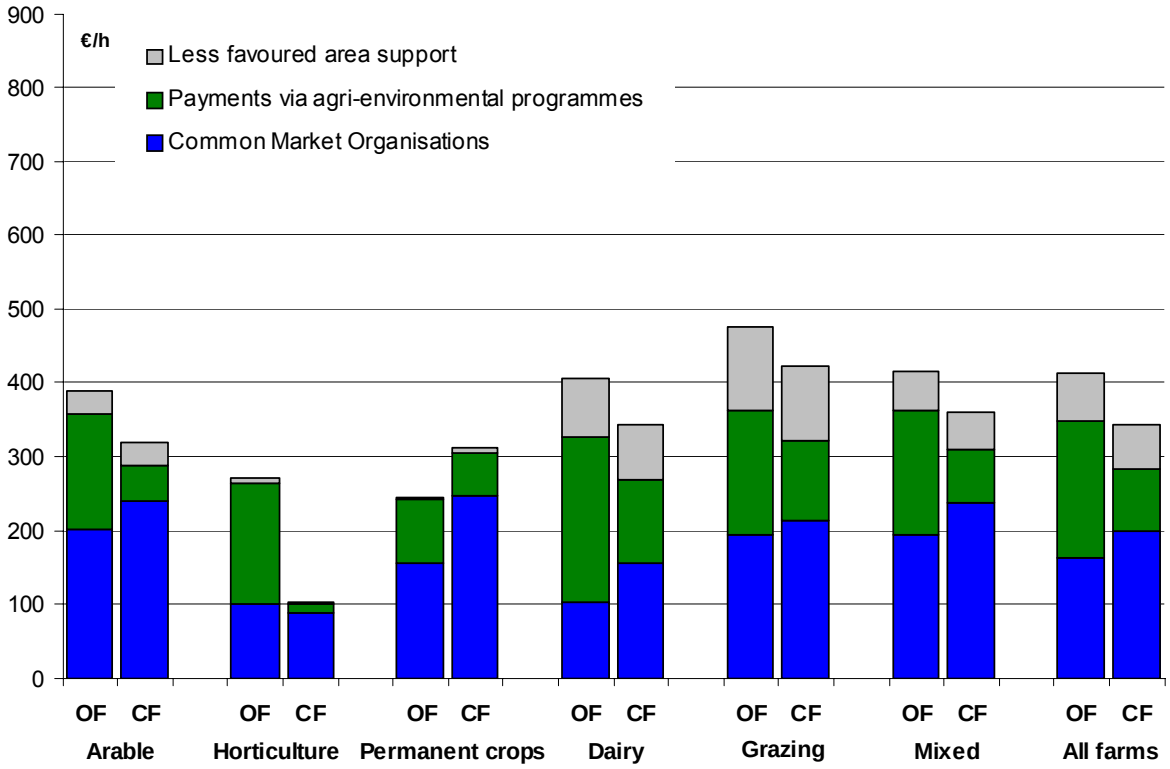


Figure 5.1 Direct payments to organic and comparable conventional farms in the EU-FADN in 2000, EUR/ha UAA

OF = organic farms, CF = comparable conventional farms.
Source: Häring et al. (2004).

only have a very small share in total beef payments. Organic farms also received a significantly higher amount of suckler cow premiums, reflecting the suitability of this activity in extensive farming systems. Extensification payments were twice as high in organic than in comparable conventional farms, a clear indication that organic farms can more easily comply with the stocking rate limits as required by the respective regulation.

With the exception of horticultural farms, where CMO payments play a less important role, the payments were lower on organic farms for all farm types. The difference is especially high for dairy and permanent crop farm samples, where organic farms received 33 to 38% fewer payments per hectare than the conventional reference farms. The difference can be attributed to the much higher payments received by the conventional farms for olive growing as the sample of permanent crops farms consists mainly of farms in Portugal and Spain. As production aid for olive growers was paid per tonne of olive oil delivered and was therefore linked to the actual output for all producers, extensive farms with lower yields received fewer payments than comparable but more intensive farms. It should be noted that sample of permanent crops farms is small (n=22) and results are not representative.

Table 5.3 CMO payments to organic and comparable conventional farms in the EU-FADN in 2000, EUR/ha UAA

	Organic farms	Comparable conventional farms
COP area payments	95	133
Set-aside	11	15
Olives	2	3
Special premium for bulls	6	14
Special premium for steers	3	2
Slaughter premium	4	6
Suckler cow premium	23	11
Extensification premium	16	8
Sheep + goat payments	3	5
Total	163	199

Source: Own calculations based on FADN-EU-GB AGRI/G.3.

5.3.3 Financial performance of organic farms

The analysis of the financial performance is based on data from the EU FADN 2001. Farm Net Value Added (FNVA) and Family Farm Income (FFI) of organic farms were compared to the respective values of conventional reference groups.

- FNVA measures the return to labour, land and capital resources irrespective of their ownership (e.g. tenanted or owner-occupied, family or paid labour, own or borrowed capital), so that the profitability of similarly structured farms can be compared. As

labour intensity may be different on organic and conventional farms, the FNVA is shown per unit of farm labour, measured in agricultural work units (AWU);

- FFI provides information on the return to land, labour and capital resources owned by the farm family, as well as the entrepreneur's risks. To account for differences in family labour use on organic and conventional farms, the FFI is shown per family work units (FWU).

The analysis showed that on average, organic and comparable conventional farms achieved similar incomes. In six of the ten countries for which data are available, and on average for the EU, FNVA/AWU was similar or slightly higher on the organic farms (figure 5.2). Overall, 56% of organic farms had incomes higher than their comparable conventional farm group.

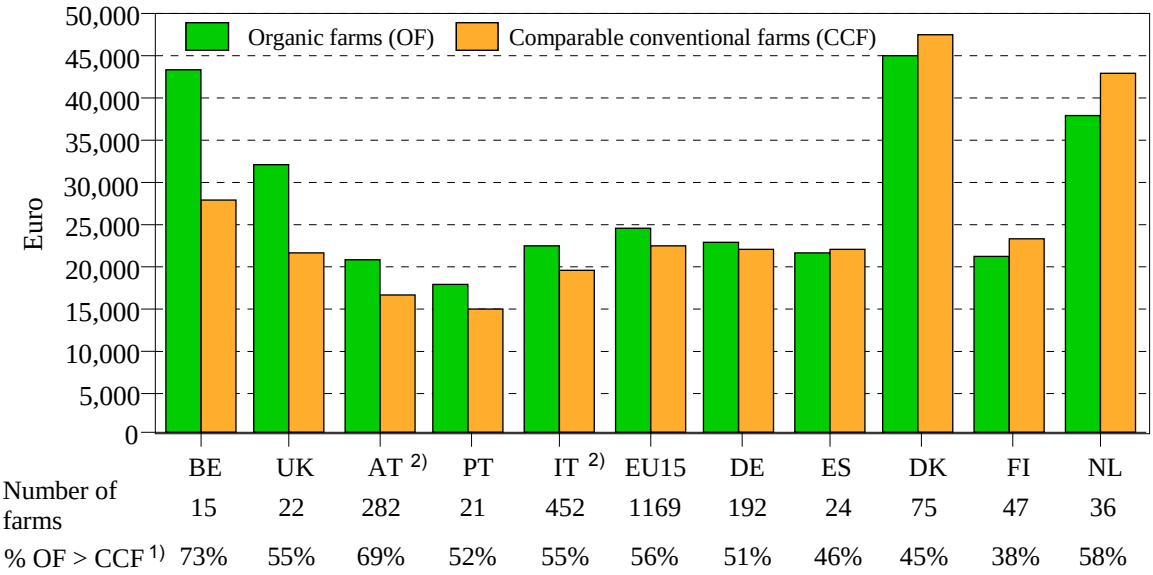
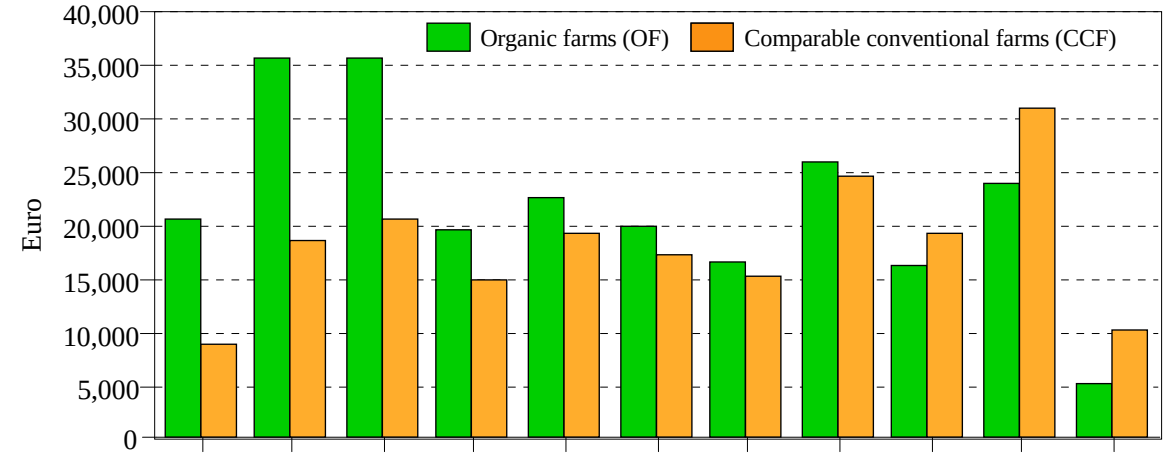


Figure 5.2 Farm Net value added per Agricultural Work Unit, 2001
1) Share of organic farms in the sample with a higher FNVA/AWU than the respective comparable conventional farm group; 2) Difference in the sample means of FNVA/AWU statistically significant ($p<0.05$).
Source: Own calculations based on INLB-EU-GB AGRI/G.3.

However, the variability in labour income is high in both the organic and the conventional farm samples. As a consequence, in combination with the generally small sample sizes, the difference of the organic and conventional averages is statistically significant only in Italy and Austria. In these two countries, on average FNVA/AWU is higher in organic than in comparable conventional farms. However, even with average FNVA/AWU being 25% higher in the organic farm sample in Austria, about one third of the organic farms in this sample fare worse than the respective comparable conventional farm, indicating the significant influence of farm and farm manager characteristics. The small number

of holdings for certain countries (BE, ES, PT, UK) mean that for these countries, no general conclusions on the profitability of organic farms can be drawn.



	UK	PT	BE	AT 2)	IT 2)	EU15	DE	ES	FI	NL	DK
Number of farms	22	21	15	282	452	1169	192	24	47	36	75
% OF > CCF 1)	50%	48%	73%	67%	56%	57%	54%	46%	38%	50%	47%

Figure 5.3 Family Farm Income per Family Work Unit, 2001
1) Share of organic farms in the sample with a higher FFI/FWU than the respective comparable conventional farm group; 2) Difference in the sample means of FFI/FWU statistically significant ($p<0.05$).
Source: Own calculations based on INLB-EU-GB AGRI/G.3.

In most countries, FFI/FWU on organic farms is also similar to or slightly higher than that on conventional farms, but there is much greater variation between countries than for FNVA/AWU (figure 5.3). This may be a reflection of differences in the farm types and size represented in the different countries.

5.4 Outlook/conclusions

The analysis of the already existing data on organic farms contained in the EU-FADN database shows the potential of this mechanism to provide useful data both for policy making and for farm business decision making, but there is much to be done to improve data quality.

The two key areas that need to be addressed in the short term, in order to make EU-FADN a useful, ongoing source of reliable data on organic farming's financial performance, are a) the identification of holdings and main enterprises and b) the sampling framework, with organic management (legally defined by EC Reg. 2092/91) introduced as a stratification criterion and appropriate modifications made to sample weightings. This will require clear guidelines and/or amendments to the FADN regulations at the EU-level, as well as appropriate implementation at national level. At both levels, it would be advis-

able to liaise with researchers and statisticians experienced in the analysis of organic farming data to ensure that the guidelines/regulations and implementation strategies can actually achieve what is required. However, even if the above changes are implemented, as long as the EU does not/cannot impose a requirement on member states to include more organic farms, utilisation of any new flexibility will depend entirely on member state initiatives. Therefore further discussions are needed at national level to run in parallel with EU-level discussions.

Acknowledgements

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6. Market signals for organic farming

Krijn. J. Poppe

Availability (LEI based on Eisfom and others)

Country	*Institute*	*Data*	*If yes, which types*	*years*	*Remarks*
A	FADN	Y	Mixed dairy, arable	2000-01	
B		N			
DK	FADN	Y	Mixed dairy, arable	2000-01	Arable only 2001
DK	FØI	Y	Arable, dairy	2001	
Fin	FADN	Y	Mixed dairy, arable	2000-01	
F		N			
D	FADN	Y	Mixed dairy, arable	2000-01	
Gr.		N			
IRL		N			
IT	FADN	Y	Mixed dairy, arable	2001	

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Availability

Country	*Institute*	*Data*	*If yes, which types*	*years*	*Remarks*
Lux		N			
NL	LEI	Y	Arable, dairy	1990-1999	Dairy from 1995
NL	FADN	Y	Arable, dairy	2000-01	
POR		N			
Spain		N			
Sweden		N			
UK	FADN	Y	Mixed dairy, arable	2001	

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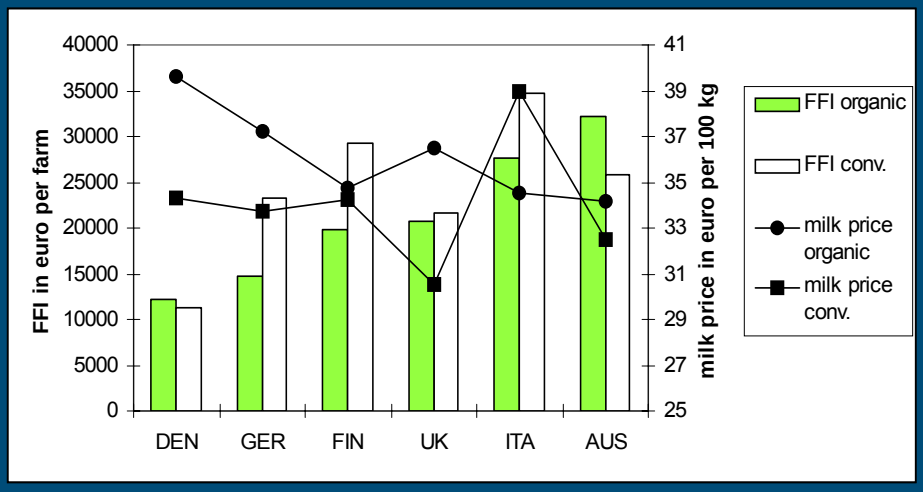
EU-FADN Dairy comparison



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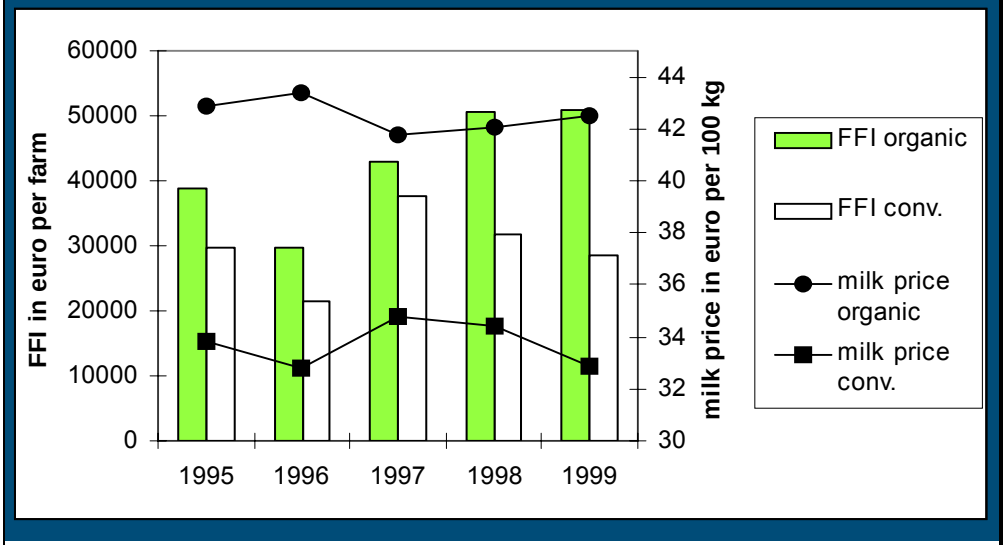
Comparison Dairy NL over the years



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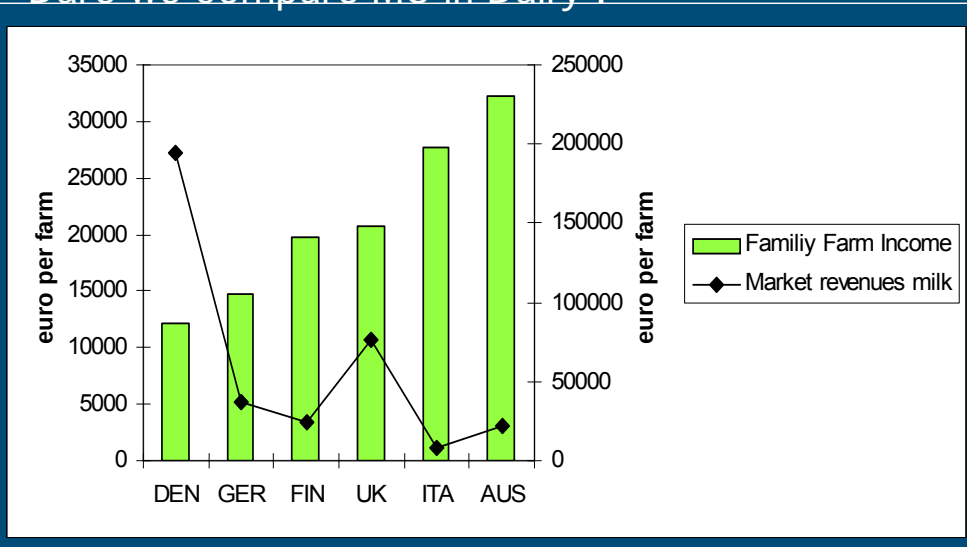
Dare we compare MS in Dairy ?



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FSS and sample *(source: Lampkin)*

Number of farms	Denmark	Finland	Austria	Italy
FSS 1998	2,228	4,975	20,207	42,238
FSS 2000	3,466	5,225	19,031	51,120
FADN 2000	1,750	3,580	14,790	.
FADN 2001	2,250	3,740	14,510	16,730
FADN 2002	2,400	3,640	14,070	19,730
Ha per farm FSS '98	44.5	25.4	14.2	18.6
FSS 2000	47.7	28.2	14.3	20.4
FADN 2000	63.0	45.4	24.6	,
FADN 2001	61.6	49.0	23.9	33.2
FADN 2002	60.5	50.8	25.5	31.0

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Influence of weighting, example field crops NL

	Ha	DSU a)	Output	FFI
Population	38.1	75		
FADN				
Unweighted	42.8	89	297.000	64.000
Weighting on type	43.2	90	299.000	64.000
Weighting on type and size	39.0	80	267.000	56.000

a) DSU= Dutch size units; 1 dsu= 1,14 esu;

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Recommendations - FADN

- Eurostat: Make data available in FSS on population (number of farms per type and sizeclass + characteristics)
- MS: include separate stratum in selection plan for organic farming
- MS: increase number of organic farms, at least in main farm types
- RICA: use information from national selection plan for weighting or use post-stratification
- [unlikely that SGMs for all organic products in all regions will be calculated]

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Thank you for your attention
Questions ?

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7. On the Development of a Farm Monitoring System in Macedonia

Vesna Ilievska[1], Mitko Kostov[2], Macedonia

Abstract

Agriculture is the main sector in the Macedonian economy. The challenges and responsibilities in the process of European integration increase the challenges in the agriculture, too. The activities to achieve a successful real advantage increase the cooperation between different public and private institutions, the activities are directed towards private economy realizing entrepreneurship in Macedonian chain of agricultural food products as an invigorator for rejuvenating the agriculture.

Development of the quality of FMS enabled a solid basis for implementation of FADN in Macedonia and gave possibilities to explore the economic parameters of a specific farm at micro level.

The farm data of resources, yields, income and cost enable development of procedures and methods for dynamical and quality transformation in the process of adapting of the farms according to the standards that European Union demands.

7.1 Private agricultural sector

One feature that is typical for the small agricultural farms in Macedonia is that the land is divided on several parts and on average there are four or more parts which are not placed one to each other. Also there are differences in the nature resources and characteristics. The country spreads between 40 and 42 degree of latitude, forming a zone characterized with Mediterranean, continental and mountain climate.

Besides producing products for sell farmers produce the food for their needs mostly by themselves. The farms are mostly mixed with crop and livestock production. It is the beginning phase of introducing bookkeeping of records and unification of the bookkeeping of farm data.

7.2 Relation between data collecting and giving advisory services

In view of rapid development of the informative society, when there is a need for implementation of the latest technical and technological achievements, the agricultural sector

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should be considered, too. This implies need of changes in the agricultural sector that is undeveloped and placed in the rural areas, and in addition the farmers are not well informed. This requires on-time quality information with fast sustainable solutions which will contribute to the development of the agricultural sector. The information becomes one of the most important factors for successful management of the resources in every area. That is why the advisory services can give an important contribution to the development of the agricultural production.

The agricultural sector in Macedonia is in a process of restructuring. Adequate information is absolutely necessary in this process, but it is almost impossible to have. In order to solve a part of this problem, a Program for financial farm monitoring is initiated. In the year 2001, this initiative was supported by a World Bank Project in accordance with Ministry for agriculture, forestry and water-economy (MAFWE). At the moment, the process is supported by a project financed by Sida through Statistics Sweden and by the Macedonian agricultural advisory service program (MAASP) within MAFWE. By using its own capacities and its own motivation, NEA, the Agency running the FMS, established a financial farm monitoring as a pre-condition for giving quality advices. This activity will strengthen advisory services in agriculture, and will enable implementation of FADN. The quality of the advisory services depends on information about the farm that advisors have on their disposal. This is the reason why a well-formed database of farm data is needed. It is also necessary as a connection between wide macro-economy reform of Macedonian agriculture and rural development. Also, farmers by themselves give efforts to transform their agriculture, as a reflection of demands and opportunities, which are result of approaching of Macedonian society and economy towards European Union through the process of stabilization and association.

7.3 Implementation of FMS

Implementation of the FMS enables development of a farm to be followed by experts. The advisors are present on the field and there they get high quality on-time information. At the same time, they give expert advices to the farmers and help them to overcome certain problems in the process of the agricultural production.

Until year 2000, we had on our disposal only so-cold statistical indicators. These data by themselves are insufficient for quality development of the agriculture. The FMS collects a wide range of data such as: data for the farm resources, the yields, incomes, costs, labour, and so on. FMS covers farms, which have a long-term cooperation with the advisors. The cooperation between a farmer and an advisor is based on mutual trust and an agreement for confidentiality of the data. Some of these farms have been selected as representative farms. This selection has been made on the basis of previous acknowledgments and statistical data.

Different types of data collected with the FMS give possibilities for different analyses, which can be useful for different users. Primary and main users of the database are farmers, but there are a big number of other users, which also can have benefits form the FMS database. This database is continually upgraded.

At this moment, the Agency has an appropriate Information System - software that enables the advisor to connect to the database through the network and to put the data into the database.

The FMS has been functioning in continuity for more than four years. The FMS has been upgraded during this period and it is getting closer and closer to fulfil the FADN requirements. It is very important to improve the quality of the data and to develop the guidelines and controls towards the FADN regulations. Also, it helps the data collected to be defined and unique at the very beginning of the collection of the data.

The FMS gives a possibility for calculation of gross margins for different types of crops or animals. Also, the FMS covers all the territory of Republic of Macedonia, and it covers all types of farms, with different size.

7.4 Application of information system in agriculture

The implementation of NEA's network information system that can be used both by small farms and the advisory service provides direct benefits for individual agricultural producers. The Information system is based on a WEB technology and it is very easy for the users to access the needed information. It gives possibilities for fast, on-time and quality implementation of the scientific achievements directly to the farmers.

High quality and on-time information gives a potential for creation of a development plan for agriculture, through fast processing of the data from individual farms. The database gives opportunities for satisfaction of wider interests on a State level. Also, the database gives the possibility to get closer to the Farm Accounting Data Network, and other interested counterparts, such as agricultural products processors, consumers, statistical offices and other.

7.5 Organization

NEA was founded in 1998 through transformation of former advisory centres for development of the agriculture, which functioned since 1972. The transformation was supported by the World Bank Project with an aim to achieve better quality of advisory services for the individual farmers.

The Agency is an independent institution and it is financed directly from the budget of Republic of Macedonia.

NEA headquarters is settled in Bitola, the biggest agricultural region in Macedonia. NEA has 30 working units all over Macedonia grouped in six regional centres. NEA is divided into three sectors. The main sector is the Sector for development of the agriculture.

Main activities of NEA are:

- giving advisory services to the farmers and farmers associations;
- implementing the latest scientific achievements;
- direct realization of measures for completing the Program for development of agriculture;
- to create technical advisory packages.

The quality of these activities improves with using the database created with FMS. The success of the FMS is based on:

- long-term experience and cooperation between the advisors from the Agency and the farmers;
- the status of the Agency which enables bigger trust, because the farmers knows that the data are protected;
- 30 working units of the Agency covers all the territory of Macedonia and the advisors form the Agency are constantly present on the field;
- the Agency is a link between the farmers and the science;
- the Agency is headed by a Manger Board. The Manage Board is composed from nine members who are appointed by the Government of Republic of Macedonia on suggestion of the Minister of agriculture, for a term of four years. Six of the members are private farmers, one member is comes from the Agricultural Institute, one member from the Institute for livestock breeding and one member from the agricultural faculty;
- on the meetings of the Managing Board the farmers represent the interest of the farmers, brings out their demands and these demands are later presented to the MAFVE;
- the motivation of the advisors for collecting data, because they are aware that only if they collect on-time and quality data, they will be able to give a high quality services to the farmers.

7.6 Establishing FADN

Quality support of data enables setting a basis for establishing FADN and adapting the information system to be compatible through improving the organization of the process and introducing control systems. With permanent support of Statistics Sweden system controls are being established, which helps to improve quality of data, processes are being defined to obtain certain indicators for functioning of quality dissemination.

At the moment, FMS-FADN consolidates and confirms the organisational set-up of NEA.

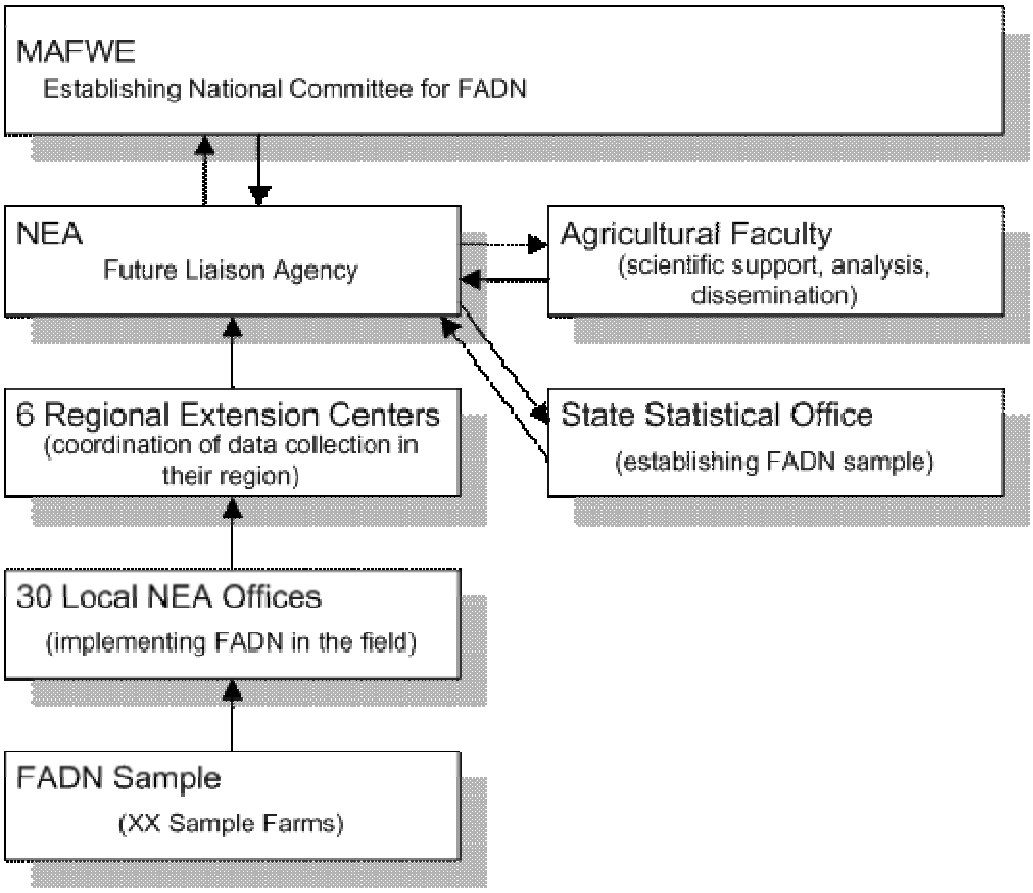

Figure 7.1 NEA as future liaison agency

7.7 The variables of the FMS and grouping data

In this section a more detailed description is given on the content of the FMS variables. One summary report for particular farm (figure 7.2) shows variety of data types at basic level. These data are divided according to time of producing, type of cost etcetera. There are data for general indicators as association membership, having off-farm income, investments, processing types in farm etcetera.

The Information system enables the basic data for specific farm given in the table to be grouped according to different criteria, i.e. type of production (animal/crop), type of cost/income from final processing of agricultural products (animal/crop), etcetera (figure 7.3).

Data	Quantity	Measurement unit	Value	Note
817				Farmer ID
Region				Strumica
Altitude	<300	m		
Fields:	3	ha	1080000	In total
	0,2	ha	640000	class 2
	0,5	ha	150000	class 3
	0,4	ha	100000	class 4
	1,9	ha	190000	class 7
Cultures:	2.1	ha		In total
Tomatoes	0,1	ha		covered, irrigated
Green tomatoes	0,1	ha		covered, irrigated
Onion	0,4	ha		uncovered, irrigated
Autumn cabbage	0,8	ha		covered, irrigated, yield in the next
Watermelon	0,7	ha		covered, irrigated
Yields:				
Tomatoes	7200	kg		
Onion	5150	kg		
Watermelon	22400	kg		
Green tomatoes	6012	kg		
Income:			522180	In total
Tomatoes	6000	kg	179200	
Onion	5150	kg	61800	
Watermelon	22400	kg	183680	
Green tomatoes	7120	kg	97500	
Costs:			230612	In total
Tomatoes			40680	
Onion			22762	
Watermelon			72550	
Green tomatoes			20940	
Autumn cabbage			73680	
Storage:				In total
Tomatoes	9109	kg		
Labor:	1712	часа		In total
Head of the farm	553	часа		
Family members	638	часа		
Others	521	часа		
Equipment:			320000	In total
Trailer			80000	
Tractor Ferguson			200000	
Plough			40000	
Objects:			2670000	In total
Store			600000	
Пластеник			70000	

Figure 7.2 Summary report of one farm

7.8 Users

The economic and quantity data of FMS, and their on-time processing enable the number of potential FMS users to increase. Each user can access a specific part of the database according to the given privileges and rights. With permanent upgrade of the software specific reports for dissemination of data will be produced. This enables the system to be accessed from outside.

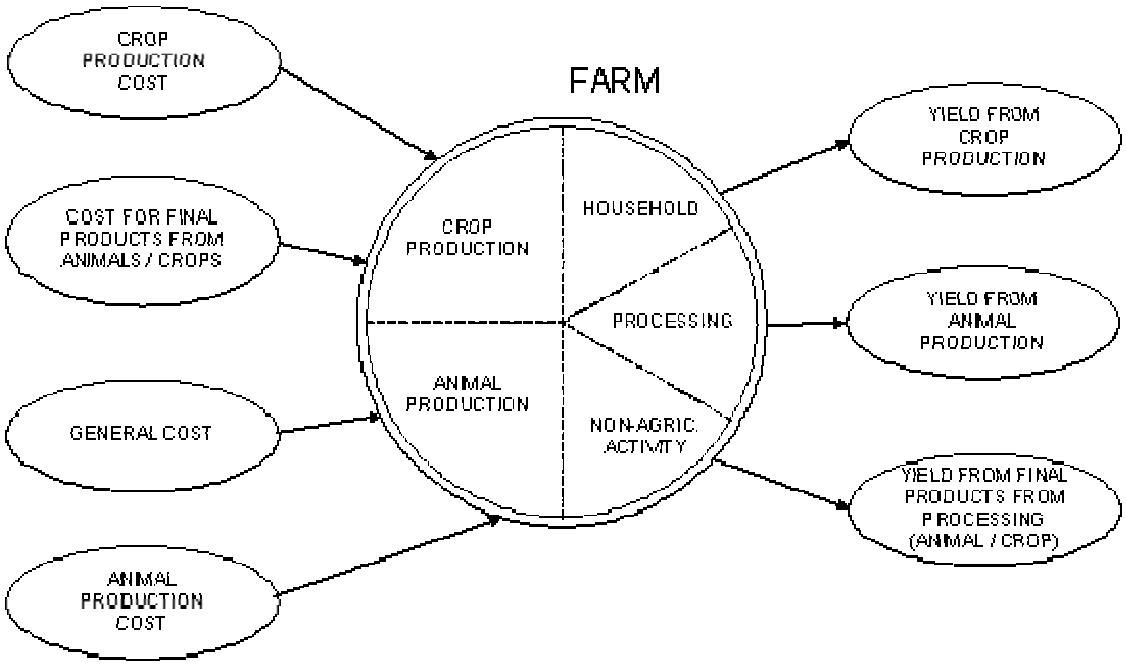

Figure 7.3 Structure of farm with grouping data

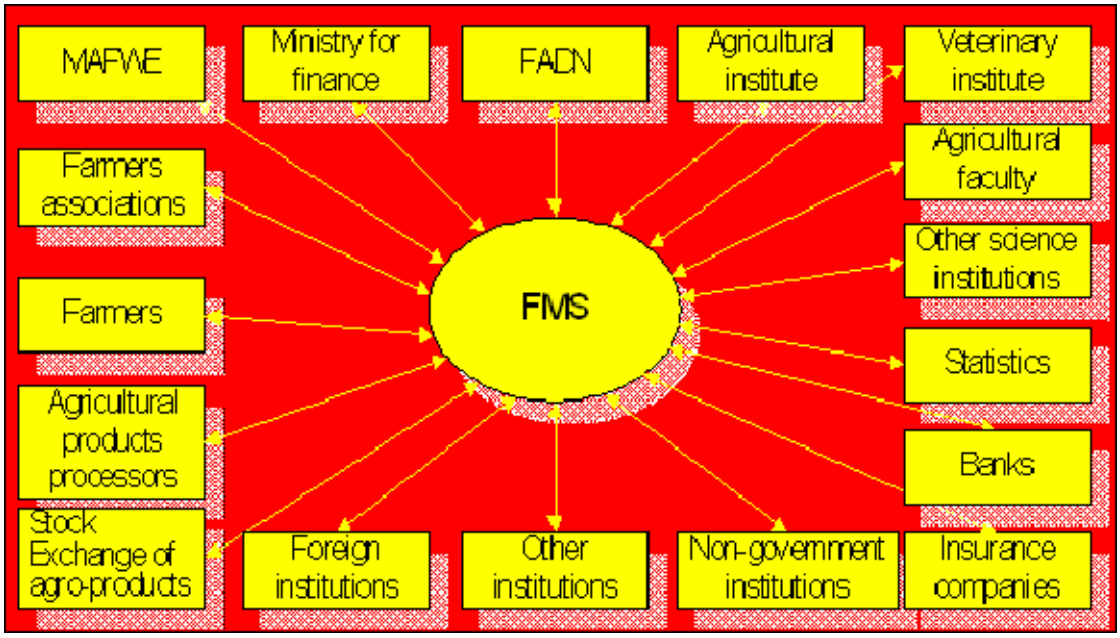

Figure 7.4 Potential users of the FMS

7.9 Results

The Information System enables entering of about 250 types of different farm data. In the first year of the implementation of the System, the data were more general. In year 2003 the quality of the data was improved. Published reports contain data for representative farms.

Table 7.1 Size of the farms by farm type (cultivated land)

Farm type	Total number of farms	Of which farms with ... ha of cultivated land						
		less than 1.0 ha	1.0-2.0 ha	2.0-5.0 ha	5.0-10.0 ha	more than 10 ha	total (%)	total agricul-tural land
A. Vegetable growers	56	5,57	7,60	33,86	22,21	30,76	100	3,08
B. Fruit producers	16	3,31	30,06	26,02	40,61	0,00	100	2,26
C. Vini-culturists	52	6,61	30,26	46,22	5,67	11,24	100	1,80
D. Arable farms	28	0,00	2,36	23,92	35,39	38,34	100	5,75
H. Mixed plant farms	49	1,32	5,77	21,82	41,27	29,81	100	4,75
I. Cattle farms	45	2,27	6,31	28,55	40,00	22,87	100	3,98
J. Sheep farms	52	0,99	4,42	15,20	36,60	42,79	100	4,64
L. Pig farms	3	0,00	17,53	82,47	0,00	0,00	100	1,94
M. Mixed animal farms	13	0,98	0,00	18,56	44,20	36,26	100	6,30
N. Mixed farms	96	0,52	3,82	27,46	37,49	30,70	100	4,83
Total farms	410	1,78	6,61	26,11	34,86	30,64	100	4,07

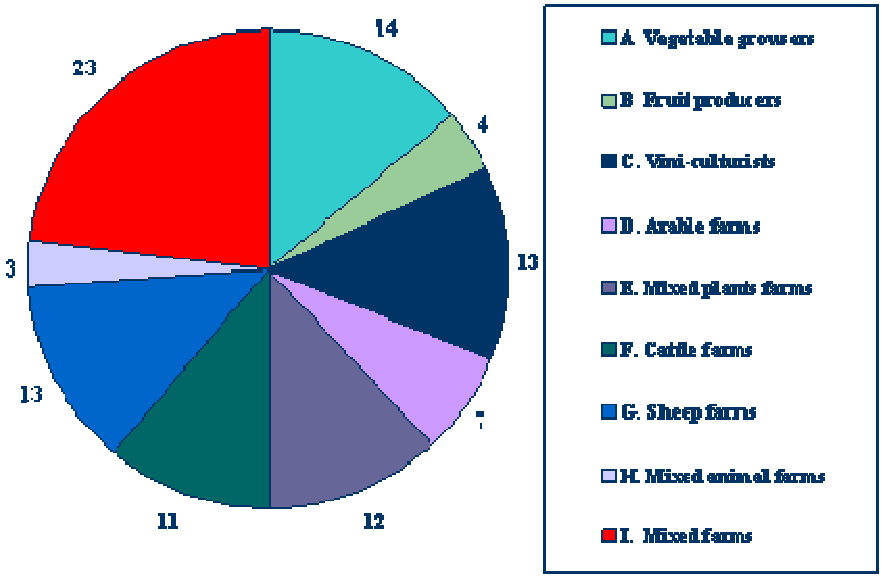

Figure 7.5 Farm typology in Macedonia in 2003

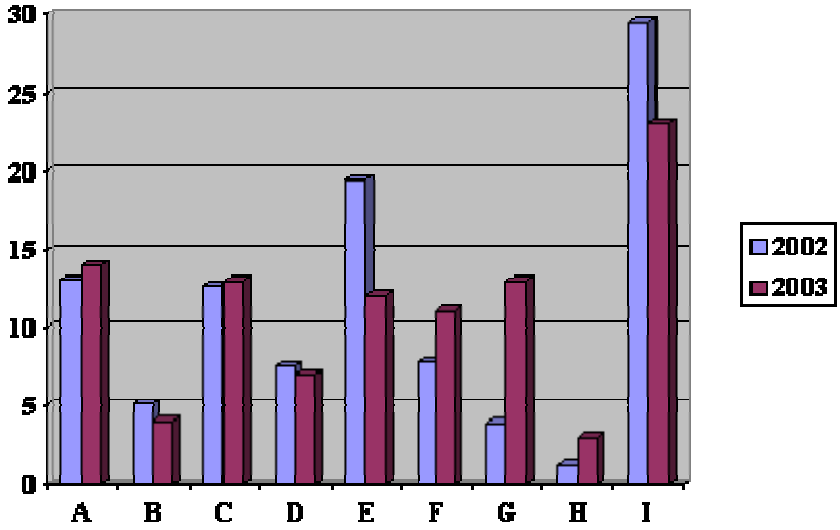

Figure 7.6 Farm typology in Macedonia in 2002 and 2003

Table 7.2 Gross margin calculations for some major crops/animals (in Denars)

Crop/animal	Calculated Gross Output	Calculated Direct Costs	Gross Margin
Wheat	32,878.51	16,098.28	16,780.23
Barley	26,075.31	14,137.81	11,937.50
Corn	58,195.44	18,026.82	39,988.61
Tomato	434,276.30	102,420.73	331,855.57
Pepper	349,522.75	72,375.87	277,146.88
Watermelon	131,070.66	39,959.31	91,111.34
Potato	291,073.84	120,897.73	170,176.11
Onion	293,299.44	102,767.87	190,531.57
Cabbage	212,217.15	75,874.60	136,342.54
Beans	131,450.26	29,218.89	102,231.36
Plums	110,172.17	46,187.83	63,984.34
Apple	379,219.27	124,860.70	254,358.57
Tobacco	156,273.48	17,649.32	138,624.16
Lucerne	168,078.16	15,068.98	153,009.18
Milking cow	87,978.04	60,767.30	27,210.75
Sheep	6,158.66	3,152.63	3,006.02

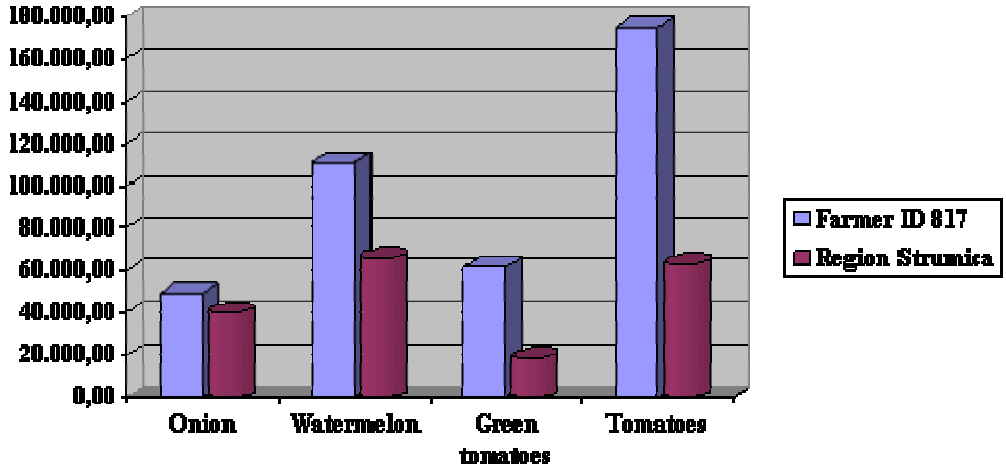

Figure 7.7 Comparison of particular farm with the region where the farm belongs to

7.10 Conclusion

Development of the quality of FMS enabled a solid basis for implementation of FADN in Macedonia and gave possibilities to explore the economic parameters of a specific farm at micro level.

The farm data of resources, yields, income and cost enable development of procedures and methods for dynamical and quality transformation in the process of adapting of the farms according to the standards that European Union demands.

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8. The contribution of farm typology to farm level analysis of the Canadian agricultural sector

Verna Mitura, Cally Abraham, Katrin Nagelschmitz, Fabrice Nimpagaritse [1]

Abstract

The primary objective of this paper is to describe the diversity of Canadian farm families, their family income profile, and income distribution. The Farm Financial Survey (FFS) is the primary source of data for the study. The 2003 FFS (calendar year 2002 financial information) is used when making a single-year analysis. The analysis of longer-term trends uses the FFS from 1992 through 2004 inclusive. Farms are classified into eight different types according to the following characteristics: age of the operator, total family income, and farm sales. The result of the analysis is an in-depth portrait of Canadian farms and demonstrates how the farm typology classification can provide insights about the agricultural sector.

Key words: farm families, farm households, farm typology, farm income, off-farm income, Farm Financial Survey

8.1 Introduction

Canadian farms, like those in many other countries, vary widely in farm size, production type, sources of income and socio-economic characteristics. The vast majority (88%) of the aggregate gross farm income in Canada is generated by family farms (Bollman, 2005). Therefore, it is important to pursue a more holistic understanding of the 98% of Canada's 246,925 census farms that are 'family farms'.[2] Changes in Canada's farm structure have created a need to study and reflect on the diversity of farm families and how they compare economically to the general population. Micro level farm data is becoming more important as farm families and the farms they operate become increasingly heterogeneous.

The primary objective of this paper is to describe the diversity of Canadian farm families, their family income profile, and income distribution. Farms are classified into eight different types according to the following characteristics: age of the operator, total family income, and farm sales. The result of the analysis is an in-depth portrait of Cana-

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[2] A 'family farm' is defined according to the 2001 Census of Agriculture. It includes all 'census-farms' organized as proprietorships, written and unwritten partnerships, and family corporations. A 'Census-farm' is defined as any agricultural holding with some agricultural products for sale.

dian farms and demonstrates how the farm typology classification can provide insights about the agricultural sector.

A companion paper prepared at AAFC entitled 'Developments in indicators of Canadian farm family well-being: The importance of household definition' compares farm and non-farm households to explore the Canadian farm population within the larger social context (Abraham et al., 2005). A large longitudinal general population data set, the Survey of Labour and Income Dynamics (SLID) is used for the analysis. Given the increased importance of off-farm income to farm families, the boundary between farm and non-farm households is 'fluid' and the definition of 'farm household' is important in an analytical context.

8.2 Data Source and Methodology

8.2.1 Farm Financial Survey (FFS)

The Farm Financial Survey (FFS) is the primary source of data for the study. The 2003 FFS (calendar year 2002 financial information) is used when making a single-year analysis. An analysis of longer-term trends uses the FFS from 1992 through 2004 inclusive.

The major objective of the FFS is to collect information on the financial situation of Canadian farms. Information is collected on characteristics of the operator/operation, land use, livestock and poultry numbers, capital investments/sales, revenues and expenses, assets and liabilities, program payments, and non-farm income sources.

The FFS target population is all Canadian farms that were active at the end of the reference year. Exclusions to the survey are farms with less than $10,000 in sales from agricultural activities (prior to 1998 the cut-off was $2,000) and non-family farms.[1] The Census of Agriculture is used as the preliminary list frame and a process of adding farms based on information from other Statistics Canada programs (i.e. Farm Update Survey, the Large Agricultural Operation program) to account for new farms since the Census or farms not identified by the Census is also made.

8.2.2 Farm typology classification

The 'family farm' is the basis of the farm typology classification used in this study. Within the FFS, family farms include those that are operated as sole proprietorships, partnerships or family corporations. When the farm is operated by more than one family, the farm family is the family of the operator who answered the survey. In turn, the family is defined as the operator, the operator's spouse and never married children residing in the same household. Farm income and family wages are attributed to the family according to its ownership share.[2]

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[1] Non family farms include Hutterite Colonies, communal operations, institutional farms, farms located on Indian Reserves and farms that are part of multi-unit holdings.

[2] For the FFS prior to 2000 the ownership share is assumed to be 100% for corporations and partnerships given the question on percent ownership of the operation was not asked.

The farm typology classifies farms into two broad categories: 'non-business focussed' and 'business focussed' farms. Farms are selected and classified in the following order:

- Non-Business Focussed Farms
  - *retirement farms* are farms in which the oldest operator is 60 years of age or older and receiving pension income and where no children are involved in the day-to-day operation of the farm;
  - *lifestyle farms* are very small-size family farms (revenues of $10,000 to $49,999) with total family off-farm income of $50,000 or more;
  - *low income farms* are very small to small-size family farms (revenues of $10,000 to $99,999) with total family income less than $35,000.

  The remaining farms are defined as 'business focussed' and are grouped according to total operating revenues.[1]
- Business Focussed Farms
  - very small farms: $ 10,000 - 49,999;
  - small farms: $ 50,000 - 99,999;
  - medium farms: $100,000 - 249,999;
  - large farms $ 250,000 - 499,999;
  - very large farms: $ 500,000 and over.

For the analysis of farm typology from 1991 to 2003, all financial variables were converted to 2002 dollars. To be consistent over time, the minimum revenue cut-off was set at $10,000 (2002 dollars) for all years. Once these adjustments were made, the typology definition was applied.

8.3 Results

8.3.1 The diversity of Canadian farms and farm families

The distribution of farms by typology in Canada is shown in figure 8.1. The highest proportion of farms is the 'medium' farm category (revenues $100,000 to $249,999) at 23% and next is 'retirement' farms (18%) and 'low income' farms (16%).

Between 1991 and 2002, the proportion of 'retirement' farms increased from 11 to 18%, 'lifestyle' farms increased from 7 to 9% while 'low income' farms declined from 22 to 16%. Over this period, the proportion of 'medium' farms declined from 28 to 23% of farms with their share of farm revenues dropping from 30 to 17%. The proportion of 'large farms' increased from 9 to 14% while their share of farm revenues stayed constant at 22%. 'Very large' farms increased from 4 to 8% of farms while their share of farm revenues increased from 28 to 46% (data not shown). Therefore, in 2002, 22% of the farms were 'large' or 'very large' but they accounted for 68% of aggregate gross farm revenues (figure 8.2).

[1] The typology definition of business focussed farms is slightly changed from previous AAFC studies. The primary difference is the previous large farm definition of $100,000 to $499,999 has been sub-divided and the category names have been re-defined from very small to very large.

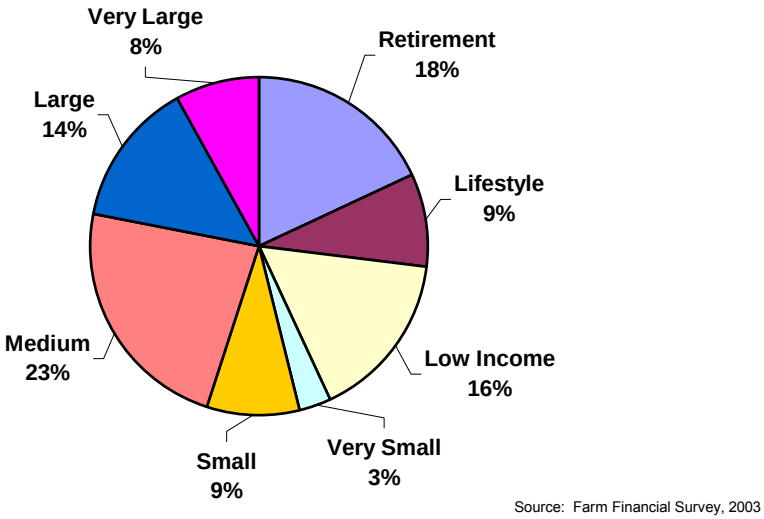


Figure 8.1 Distribution of farms by typology, Canada, 2002

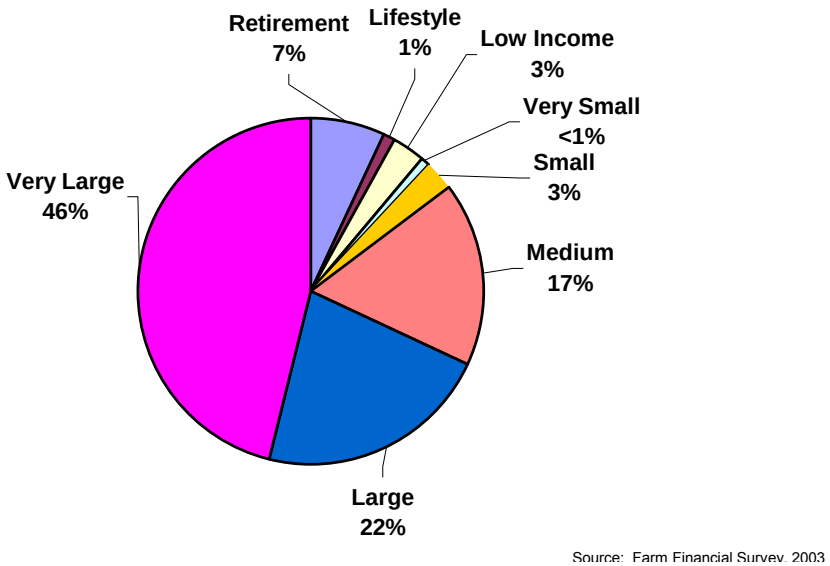


Figure 8.2 Distribution of gross farm revenues by typology, Canada, 2002

The distribution of farms by typology varies by farm type. Farm type is determined by the commodity that constitutes more than 50% of farm sales. The highest proportion of 'retirement' farms are grain & oilseed (21%) and beef cattle farms (21%). The highest proportion of 'low income' farms are beef cattle farms (23%), and the highest proportion of 'very large' farms are dairy and poultry (26%), hog (19%) and horticulture (19%) (table 8.1).

Table 8.1 Distribution of farms by typology and farm type, Canada 2002

	Grain & oilseed	Beef cattle	Hog	Dairy & poultry	Horti-culture	Other	Total
Non-business focussed:							
retirement	21	21	2	4	16	20	18
lifestyle	7	13	0	4	7	14	9
low income	14	23	5	7	14	23	16
Business focussed:							
very small	3	5	0.4	0.4	2	5	3
small	10	10	3	4	8	11	9
medium	25	18	40	26	20	15	23
large	14	7	31	29	13	8	14
very large	6	4	19	26	19	4	8
Total	100	100	100	100	100	100	100

Source: Farm Financial Survey, 2003.

8.3.2 The importance of farm and non-farm income

Farm income[1] is relatively concentrated on 'medium' to 'very large' farms in Canada. In 2002, these farms made up 45% of the farms but accounted for 90% of the farm income (figure 8.3).

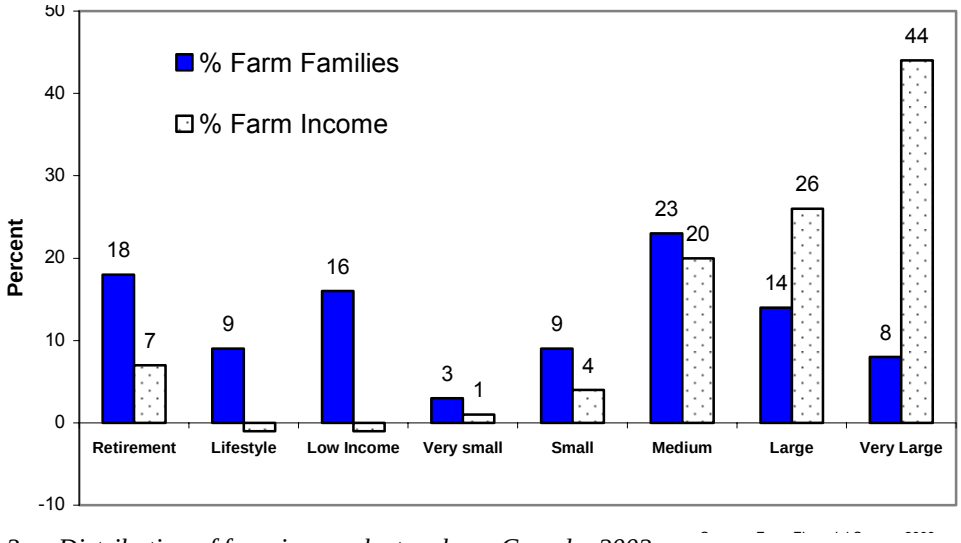


Figure 8.3 Distribution of farm income by typology, Canada, 2002
Source: Farm Financial Survey, 2003.

[1] Farm income equals total gross farm revenues less cash operating expenses plus farm wages paid to family members.

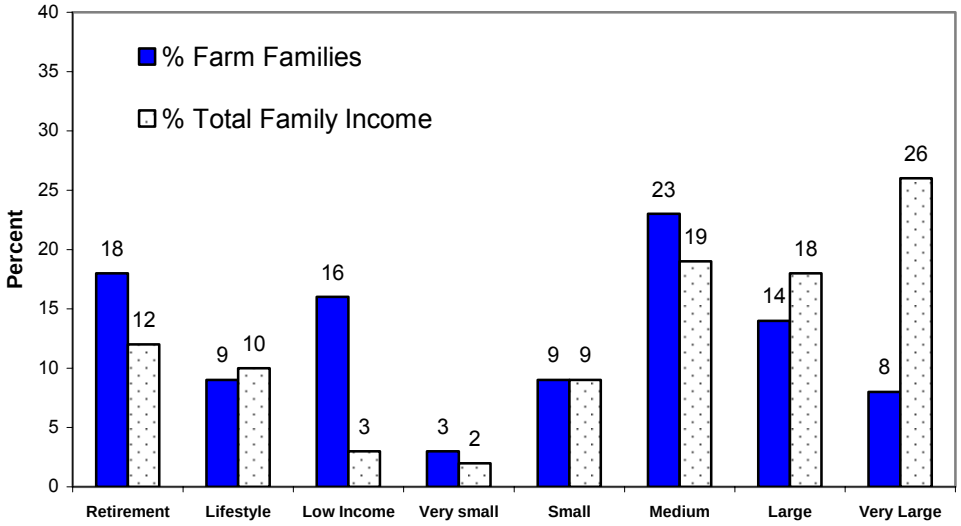


Figure 8.4 Distribution of total family income by typology, Canada, 2002
Source: Farm Financial Survey, 2003.

However, farm income is only one of a number of possible sources of farm family income. Other sources may include off-farm wages and salaries, investment income, pension income, inheritances/gifts, and other forms of income such as custom work and machine rental. Compared to the distribution of farm income, when all sources of income are taken into account, the distribution of farm family income is more evenly distributed among the typology groups (figure 8.4). The main exceptions are the 'low income' typology group where 16% of the farm families receive only 3% of the total income and the 'very large' farms which make up 8% of farm families but earn 26% of the total income.

Non-farm income has become increasingly important to farm families in Canada as the structure of agricultural production has changed. Based on the FFS, in 2002 average farm family income was $73,400 with 44% of total family income derived from non-farm sources (table 8.2). It is important to note that in this analysis, the wages and salaries paid to family members from farm revenues are included as farm income.[1] In addition, depreciation costs are not included as a farm expense.

A wide distribution exists in the reliance of non-farm income depending on the farm typology. For the average 'lifestyle' and 'low income' farm family, family income is derived entirely from non-farm income sources with losses reported for farm income. Nearly one-third (31%) of off-farm wages and salaries are earned by 9% of families operating a 'lifestyle' farm. For 'business focussed farms', the larger the farm in terms of gross farm revenues the lower the reliance on non-farm income sources. Families operating a 'very small' farm received 78% of their total family income from non-farm income, while fami-

[1] A recent report by Statistics Canada entitled 'Statistics on income of farm families' reports that for single unincorporated farms with total operating revenues of $10,000 and over the income from non-farming activities accounted for 72% of total family income in 2001. However, the analysis includes the wages and salaries paid to family members from the farm business as off-farm employment income.

lies operating a 'very large' farm received 10% of their total family income from non-farm sources.

Table 8.2 Farm family income by typology and income source, Canada, 2002

	Number of farms	Farm income a)	Non-farm income				Total family income b)	Non-farm income as % total family income
			off-farm wages &	interest & dividends	pension	other income		
	(number)			(dollars)				(percent)
Non-business focussed:								
- retirement	28,731	16,590	8,026	3,854	17,043	2,219	47,732	65
- Lifestyle	14,299	-3,958	77,455	2,255	2,169	6,392	84,312	105
- low income	26,330	-1,491	9,860	917	1,483	1,366	12,135	112
Business focussed:								
- Very small	5,188	10,065	28,150	1,483	2,748	2,616	45,063	78
- small	14,812	20,125	45,227	3,007	3,211	3,841	75,410	73
- medium	38,313	34,600	17,476	1,555	1,642	4,096	59,369	42
- large	22,764	78,114	13,012	2,116	1,284	4,773	99,299	21
- very large	13,704	217,169	14,260	2,773	1,637	5,006	240,845	10
total	164,140	41,290	21,761	2,222	4,490	3,625	73,388	44
				(percent distribution)				
Non-business focussed:								
- retirement	18	7	6	30	67	11	12	
- lifestyle	9	-1	31	9	4	15	10	
- low income	16	-1	7	7	5	6	3	
-Business focussed:								
- very small	3	1	4	2	2	2	2	
- small	9	4	19	12	6	9	9	
- medium	23	20	19	16	9	26	19	
- large	14	26	8	13	4	18	18	
- very large	8	44	5	10	3	11	26	
Total	100	100	100	100	100	100	100	

a) Farm income equals total gross farm income less cash operating expenses plus farm wages paid to family members; b) Total family income equals the farm family's share of the farm income plus off-farm wages and salaries, interest and dividends, pension income, and other sources of income.
Source: Farm Financial Survey, 2003.

Between 1991 and 2003, average non-farm income (in constant dollars) increased 36% from $24,100 to $32,700. Farm income has been variable over this period, with an average high farm income of $44,900 in 2001 and a low of $30,500 in 2003 (figure 8.5). In 2003, non-farm income reached over half of total family income given the decline experienced in farm income that year.

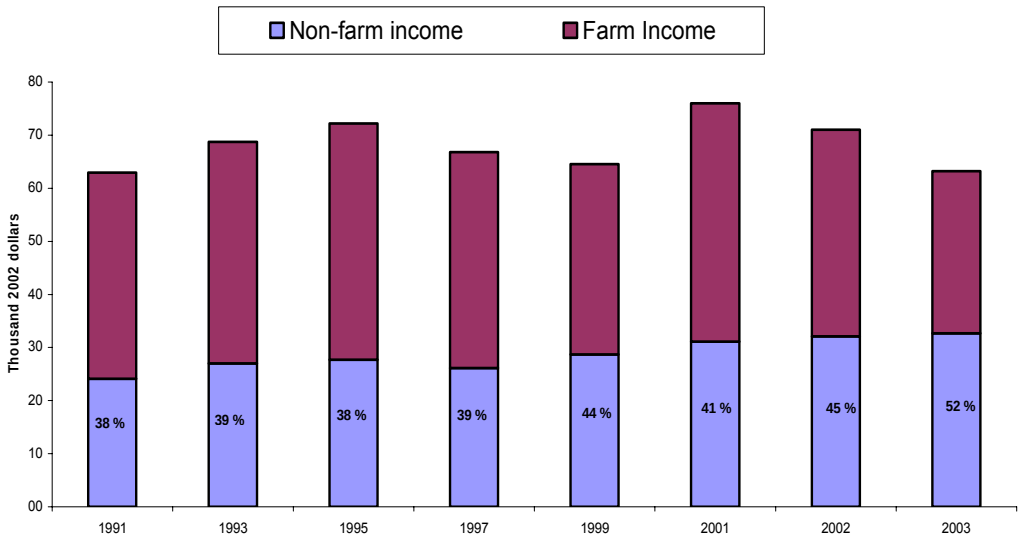


Figure 8.5 Family income from farming vs non-farm income, Canada, 1991-2003
Source: Farm Financial Survey.

The proportion of family income from non-farm sources also varies by farm type. Families operating a beef cattle farm had the highest proportion of total family income from non-farm sources (71%) while those operating a dairy or poultry farm reported the lowest (13%) (figure 8.6). This result is not surprising, given that farm types, such as dairy farms, that require more labour input have less time for off-farm work.

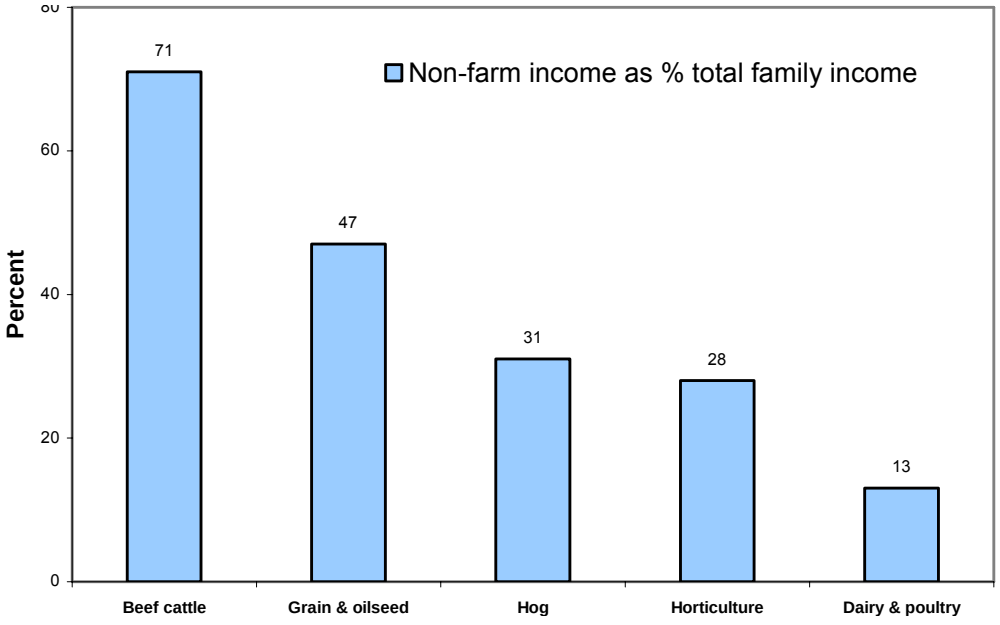


Figure 8.6 Non-farm income as a percent of total family income, by farm type, Canada, 2002
Source: Farm Financial Survey, 2003.

A comparison of farm families with more than 50% of family income earned from farm income to those with 50% or more of family income coming from non-farm income sources is provided in table 8.3. Fifty-four percent of the farm families reported more than 50% of income from farm income. Comparing these two groups shows that the average age of the oldest operator and the average education (some post-secondary education) was about the same for the two groups. The size of the farm and the average net worth for the first group was about twice that of the second group (1,178 acres vs. 588 acres respectively) and ($1.1 million vs. $517,000 respectively). The 54% of farm families that received more than 50% of their income from farm income accounted for 94% of the farm income, 16% of the off-farm wages and salaries, 31% of the interest and dividends and 27% of the retirement income.

Table 8.3 Characteristics of farm family households based on the majority of farm family income being from the farm operation vs non-farm income, 2002

Item	Majority of farmily income from farm income a)	Majority of family income from non-farm income b)
Number of farms (#)	87,887	74,433
Percent of farms (%)	54	46
Percent of gross farm revenues (%)	83	17
Average farm operator age (oldest operator)	53	55
Average education c) (oldest operator)	2,3	2,4
Average total land operated	1,175	588
Average asset values	1,433,648	612,364
Average liabilities	295,607	95,493
Average net worth	1,138,041	516,871
Distribution by source of income (%):		
- farm income	94	6
- off-farm wages and salaries	16	84
- interest and dividends	31	69
- retirement income	27	73

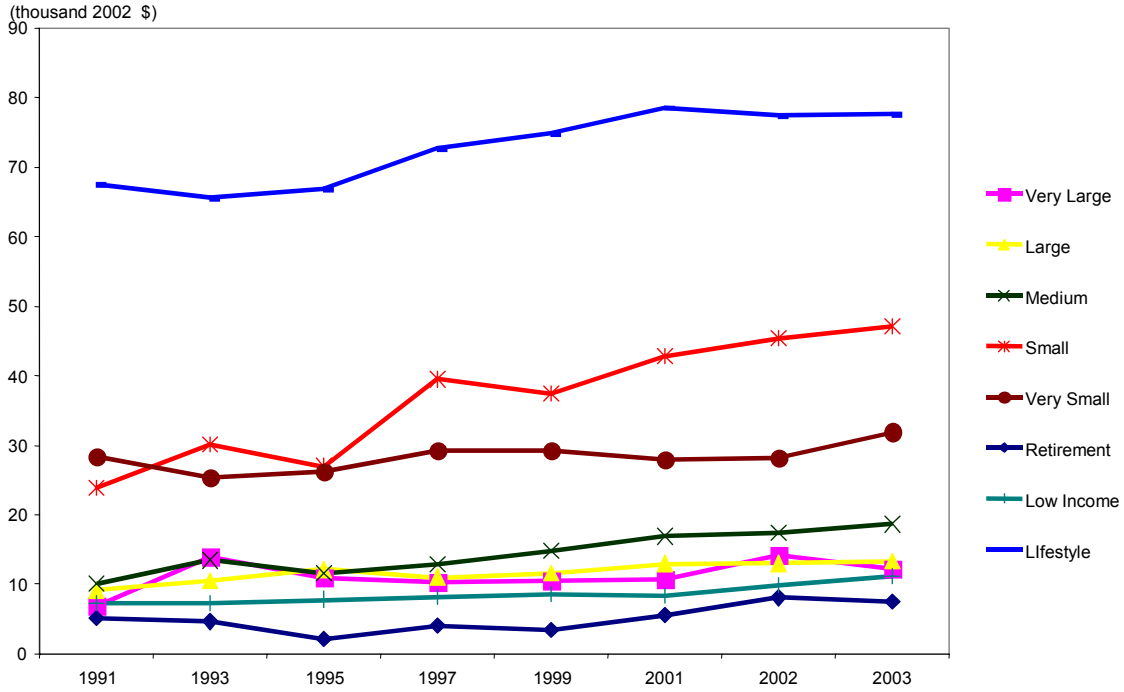
a) Farm income equals total gross farm income less cash operating expenses plus farm wages paid to family members; b) Non-farm income equals off-farm wages and salaries, interest and dividends, pension income and other sources of income; c) Less than high school (1), completed high school (2), some post-secondary (3), completed college/university certificate (4), completed university degree (5).
Note: Farms with income evenly split between farm and non-farm were included in the category as the mojority income coming from the farm.
Source: Farm Financial Survey, 2003.

8.3.3 Off-Farm Employment

Research suggests that members of farm families are increasingly engaging in off-farm employment. This may be a means to enhance and stabilize family income or they may be working off-farm for other reasons. Goodwin and Mishra (2004) found little correlation

between self-assessed risk preferences and off-farm labour supply.[1] The off-farm labour decision is affected by farm characteristics such as farm size, the seasonality of farm work, and the proximity of the farm to non-farm employment opportunities (Goodwin and Mishra, 2004; Phimister and Roberts, 2002). Demographic factors such as age, household size, and the number of children in the family (Goodwin and Mishra, 2004) were also important factors.

This analysis measures only cash off-farm wages. However, non-cash employer benefits are an important factor in the off-farm labour decision (Jensen and Salant, 1985). On the other side of the farm household ledger, the inseparability of farm expenses and household use of farm assets may underestimate farm household income. While off-farm work has been found to be positively correlated with education, on-farm work is not, suggesting that increased education is correlated with reduced leisure (Huffman, 2004). Indeed, for more than three quarters of U.S. farm operators for whom the non-farm job is the primary occupation it was also their career choice. Of the spouses of farm operators, 80% indicated that the non-farm employment was their career choice. On larger farms, non-farm employment income is more likely to come from the spouse (ERS/USDA, 2004).



Figuur 8.7 Non-farm wages and salaries, by typology, Canada, 2002
Source: Farm Financial Survey.

[1] The study focussed on the off-farm labour supply by the farm operator only (Goodwin and Mishra, 2004).

This study finds that, on average, off-farm employment wages and salaries in Canada increased 31% between 1991 and 2003 from $15,800 to $22,700. However, three of the farm typology groups, including families operating 'lifestyle', 'small' and 'medium' farms demonstrated the steepest upward trend in non-farm wages and salaries starting about 1995. Between 1995 and 2003, non farm wages and salaries of families operating a 'small' farm increased 43% from $27,000 to $47,100 and for families operating a 'medium' farm increased 38% from $11,600 to $18,600. Families operating a 'lifestyle farm' reported an increase in non-farm wages and salaries of 14% from $66,900 to $77,700, while those operating a 'low income' farm recorded an increase of 30% from $7,800 to $11,100 (figure 8.7).

8.3.4 The importance of program payments to farm families

Program payments include direct program payments (crop insurance and income stabilization programs), the government portion of withdrawals from the Net Income Stabilization Account (NISA), and environmental program payments.[1] On average, program payments for farm families in 2002 were $14,600, 21% of total family income (table 8.4). Program payments ranged from an average of $2,700 for families operating a 'lifestyle' farm to $44,000 for families operating a 'very large' farm. Families operating 'medium' to 'very large' farms claimed the greatest share of total program payments available at 78%. Program payments for these farm families accounted for between 20 and 31% of total family income in 2002 (figure 8.8).

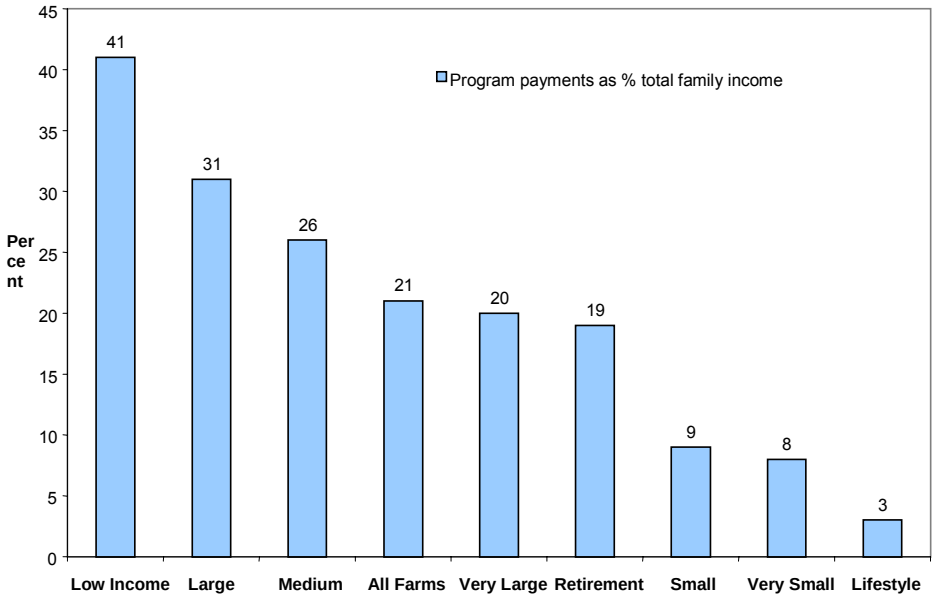


Figure 8.8 Farm program payments as a percent of total family income, by typology, Canada, 2002
Source: Farm Financial Survey, 2003.

[1] Total program payments are based on payments received by the farm business while the family share of program payments have been adjusted relative to the ownership share by individual farm families.

Families operating a 'low income' farm reported program payments averaging $4,900 or 41% of their total family income. While program payments were relatively small for low income farm families, the payments were very important as a proportion of their total family income.

The average environmental program payment was just $135 (ranging from $49 for 'lifestyle' farms to $271 for 'very large' farms).

Table 8.4 Distribution of program payments by typology, Canada, 2002

	Program payments					Family share of program payments	Program payments as % of total family income
	direct program payments		environ-mental program payments	NISA (Fund2) payment	total program payments		
	crop insurance	other income support					
Non-business focussed:							
- retirement	5,554	3,634	64	987	10,240	8,922	19
- lifestyle	1,260	1,483	49	84	2,876	2,684	3
- low income	2,613	2,444	131	705	5,893	4,930	41
Business focussed:							
- very small	2,220	1,465	49	376	4,110	3,631	8
- small	3,644	3,255	79	731	7,709	6,701	9
- medium	10,155	5,550	144	1,435	17,284	15,204	26
- large	20,193	10,800	247	2,581	33,822	29,084	31
- very large	26,968	22,315	271	5,013	54,566	44,018	20
Total	9,297	6,136	135	1,478	17,047	14,563	21
			(percent distribution)				
Non-business focussed:							
- retirement	10	10	8	12	11		
- lifestyle	1	2	3	0	1		
- low income	5	6	16	8	6		
Business focussed:							
- very small	1	1	1	1	1		
- small	3	5	5	4	4		
- medium	25	21	25	23	24		
- large	30	24	25	24	27		
- very large	24	30	17	28	27		
Total	100	100	100	100	100		

a) Farm income equals total gross farm income less cash operating expenses plus farm wages paid to family members; b) Total family income equals the farm family's share of the farm income plus off-farm wages and salaries, interest and dividends, pension income, and other sources of income.

Direct program payments by typology for the years 1991 to 2003 (constant 2002 dollars) shows that program payments have been variable over the years - declining between 1993 and 1997 and then trending upwards to 2003. The distribution of program payments among typology groups was consistent between 1991 and 1999. However, beginning in 2001 the distribution has shifted substantially in favour of very large business focussed farms (figure 8.9, 8.10).

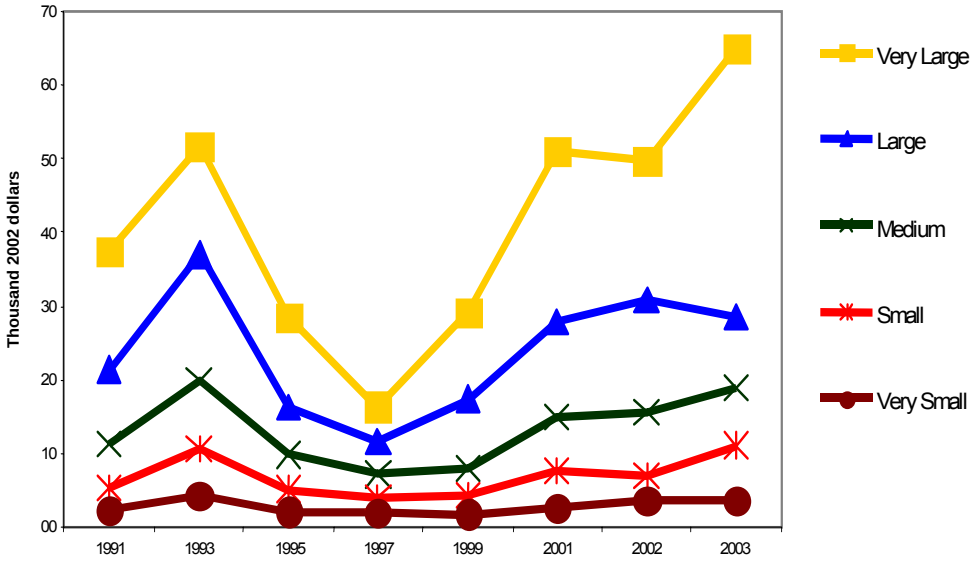


Figure 8.9 Direct government payments, business focussed farms, Canada, 2002
Source: Farm Financial Survey.

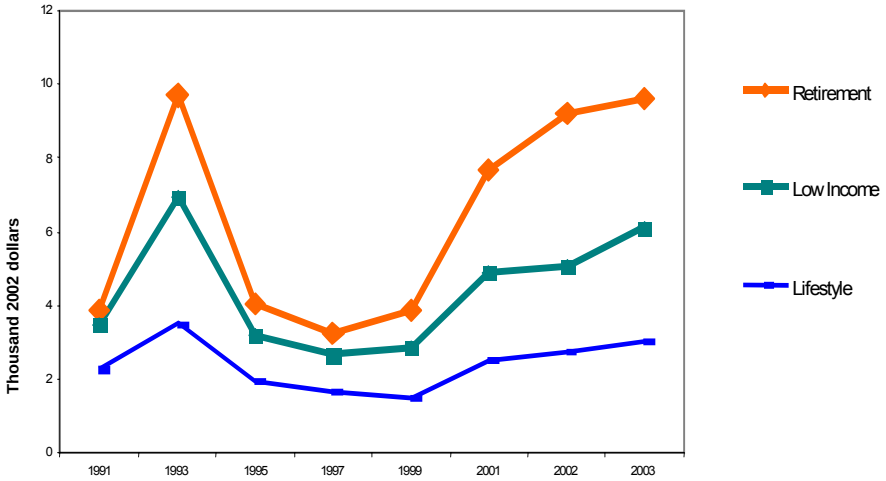


Figure 8.10 Direct government payments, non-business focussed farms, Canada, 2002
Source: Farm Financial Survey.

8.3.5 Income distribution

Another way to look at the income situation of farm families in Canada is to consider the distribution of income among the farm population. The Lorenz curve is one way to statistically illustrate income distribution. The Lorenz curve plots the cumulative share of income against the cumulative share of the population. The 'line of perfect equality' is where x = y (i.e. 20% of the population have 20% of the income).[1]

The distribution of farm income and total family income is illustrated in figure 8.11. We find that in Canada, farm income is less equally distributed compared to family income. It was found that 20% of the farm families reported 86% of the farm income and 58% of the total family income. Negative farm income was reported by 23% of the farm families and negative total family income was reported by 7%.

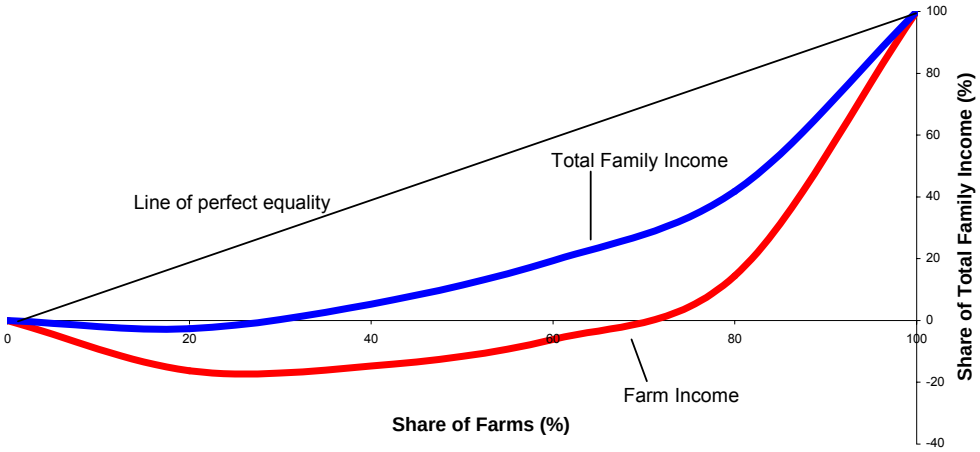
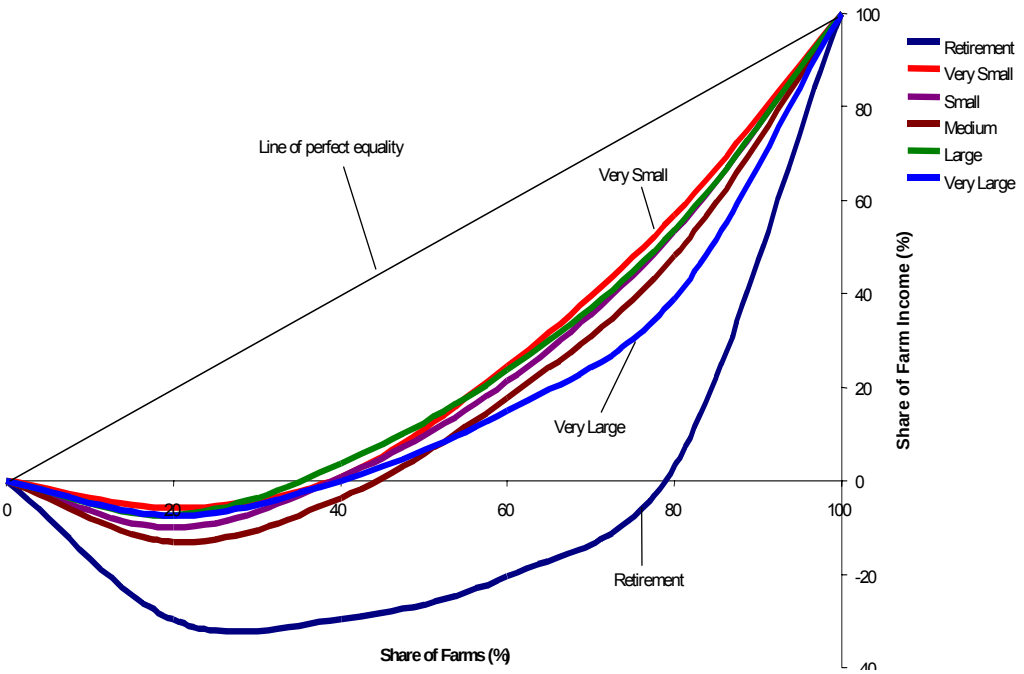


Figure 8.11 Distribution of farm income and total family income, Canada, 2002
Source: Farm Financial Survey, 2003.

An analysis of the distribution of farm income by typology shows that the income distribution is most equal for farm families operating a 'very small' farm and most unequally distributed for 'retirement' farms (figure 8.12). Twenty percent of families operating a 'retirement' farm reported 97% of the farm income of that group. For families operating a 'very large' farm, 20% reported 60% of the farm income for that group.

[1] It is not unusual for farm income (similar to other businesses) to be reported as negative. In this case, farm income will fall to negative levels on the Lorenz curve. While this is not problematic for illustrating income distribution using the Lorenz curve, it does cause an issue in the calculation of the Gini Ratio (the area between the Lorenz curve and the line of perfect equality divided by the total area under the line of perfect equality). Therefore, this analysis will report on results based on the Lorenz curve analysis.



Figuur 8.12 Farm income distribution by typology, Canada, 2002
Source: Farm Financial Survey, 2003.

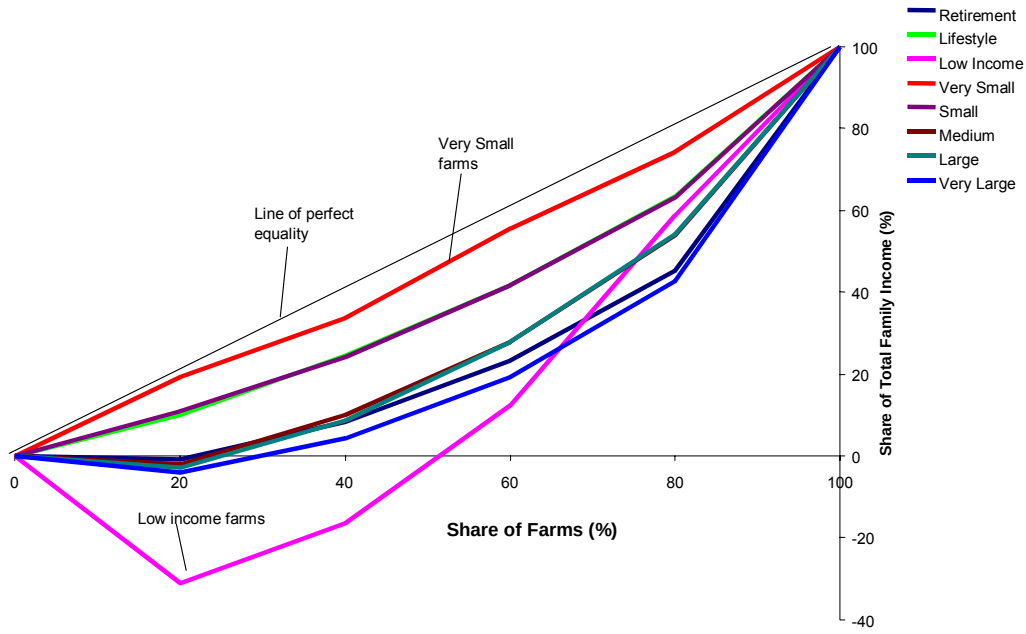


Figure 8.13 Total family income distribution by typology, Canada, 2002
Source: Farm Financial Survey, 2003.

The same analysis using the distribution of total family income shows a similar result (figure 8.13). 'Very small' and 'small' farms reported the most equal distribution of total family income. Families operating a 'low income' farm showed the most unequal distribution of income with 40% of the total family income of that group earned by 20% of the families.

A final analysis was undertaken to consider the distribution of both farm income and total family income by farm type. The results indicate that the farm income of families operating a dairy or poultry farm (i.e. those sectors under supply management) is relatively more equally distributed compared to families operating other farm types. The distribution of farm income for families operating beef cattle farms was relatively less equally distributed (figure 8.14). Thirty-four percent of families operating a beef cattle farm reported negative farm income.

There is less of a difference among farm types in the distribution of total family income. Families operating a dairy or poultry farm, or a grain and oilseed farm showed a more equal distribution of total family income compared to families operating other farm types. In particular, the distribution of total family income for families operating a hog farm was relatively less equal; 20% of these families reported 65% of the total family income for that group (figure 8.15).

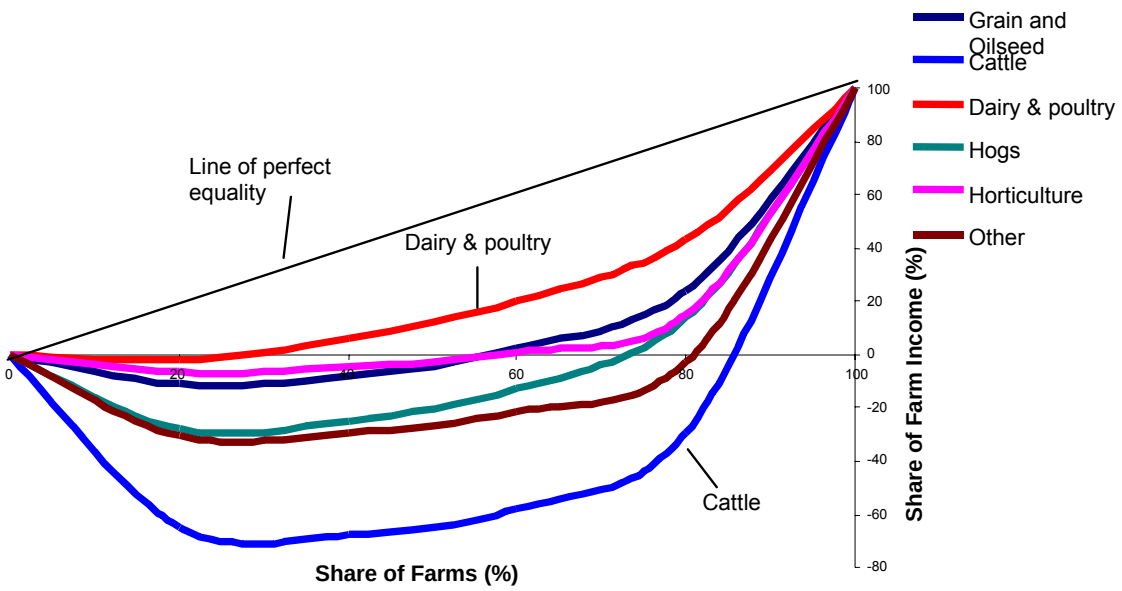


Figure 8.14 Farm income distribution by farm type, Canada, 2002
Source: Farm Financial Survey, 2003.

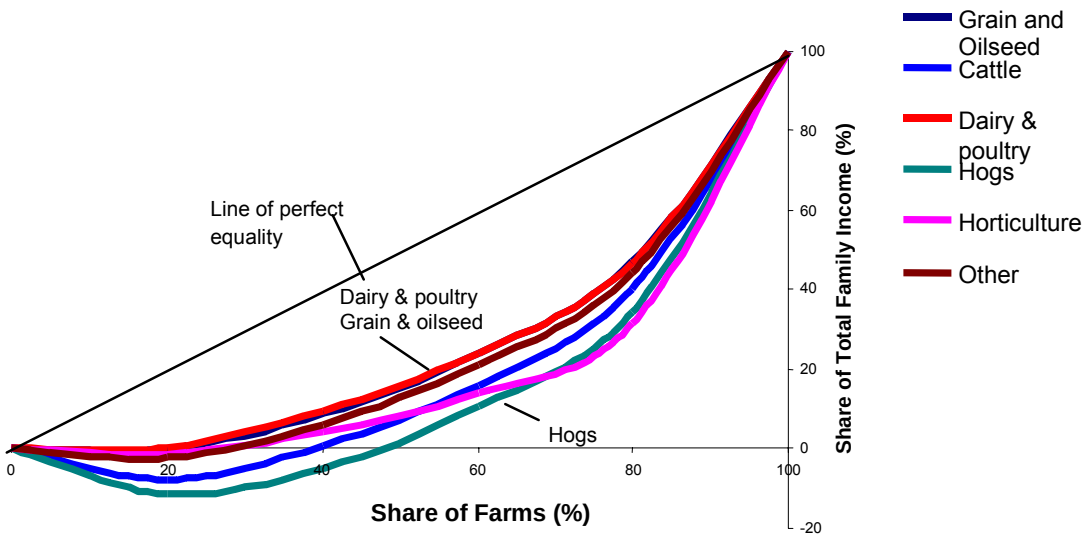


Figure 8.15 Total family income distribution by farm type, Canada, 2002
Source: Farm Financial Survey, 2003.

8.3.6 The importance of wealth to farm families

Part of the economic well-being of Canadian farm families is the accumulated wealth from farm assets. The FFS survey population is allocated into four segments based on total family income and net worth (figure 8.6). The income cutoff was based on the 2002 Canadian population average family total income of $73,200. The net worth cutoff of $230,000 was based on the average net worth of Canadian families where the major income earner was self-employed.[1]

The results illustrate that the majority of farm families (52%) were in the category of 'higher wealth and lower income'. These farm families had an average net worth of $793,000 but a farm income of only $8,300 from sales of $148,500 and a total family income[2] of $27,200. The farm families with the higher wealth and higher income were 29% of the families. These farm families received 85% of the aggregate farm income, farm sales were $432,000, total family income of $165,100 and a net worth of $1.4 million. Fifteen percent of the farm families have limited resources - lower income and lower wealth. This group reported farm sales of $66,400, farm income of $2,800, total family income of $29,300 and net worth of $135,000. The final segment was those four percent of families with lower wealth and higher income. These families on average had a net worth of $129,000 and a total family income of $115,400.

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[1] Statistics Canada, 'Average total income by economic family types' http://www.statcan.ca/english/pgdb/famil05a.htm. Statistics Canada, 'The Assets and Debts of Canadians', cat. no. 13-595-XIE. The net worth cut-off of $230,000 used in this study was based on the 1999 estimates, adjusted for inflation.

[2] Based on Statistic Canada's low income cut-offs (after tax), a family of four people living in a rural area in 2002 would have needed at least $20,000 to cover basic needs (food, clothing and shelter).

	Lower Wealth		Higher Wealth
Higher Income	4%	% of farms	29%
	$150,000	Farm sales	$432,000
	$39,800	Farm income	$119,900
	3%	% of farm income	85%
	$115,400	Family income	$165,100
	492 acres	Farm size	1,249 acres
	$323,000	Asset value	$1,758,000
	$194,000	Liabilities	$343,000
	$129,000	Net worth	$1,415,000
Lower Income	15%	% of farms	52%
	$66,400	Farm sales	$148,500
	$2,800	Farm income	$8,300
	1%	% of farm income	11%
	$29,300	Family income	$27,200
	440 acres	Farm size	878 acres
	$232,000	Asset value	$950,000
	$97,000	Liabilities	$157,000
	$135,000	Net worth	$793,000

Cutoffs:
Income - average family income of $73,200
Wealth - average net worth of $230,000

Figure 8.16 Farm characteristics based on total family income and wealth, Canada, 2002
Source: Farm Financial Survey, 2003.

8.4 Conclusion

The AAFC farm typology is a tool that enables an in-depth portrait of the diversity of farm families in Canada. Farm income is only one of a number of possible sources of farm family income. When all sources of income are taken into account, income is shown to be more evenly distributed than when only farm income is considered. However, the study also finds that across farm typology groups, a wide distribution exists in the reliance on non-farm income. For 'lifestyle' and 'low income' farm families, on average the family income is all derived from non-farm income sources with losses reported for farm income. For business-focussed farms, the larger the farm in terms of gross farm revenues the lower the reliance on non-farm income sources.

The typology alludes to the goals of farm operators as they might differ depending on the farm and non-farm activities of the farm family. Surveys have indicated that farm families' goals are diverse. Business goals rated as important[1] by more than 85% of Canadian farm operators are paying off debt, maximising return on investment, producing the best products possible, and maximising productivity. Only a little more than a quarter of operators (28%) rated expanding the farm or increasing production as important goals. Other 'non-business' goals rated as important by Canadian farm operators were to provide a reasonable income for their families, provide a good place to raise a family, create a heritage for the next generation, and be part of the community. Given these diverse goals, a

[1] The 2004 FFS included questions on the business and personal goals of farm operators. Goals are considered 'important' if they rate 7 or higher on a scale of 1 (not important) to 10 (very important).

diverse farm sector is not surprising. Therefore, a policy tool that incorporates this diversity is useful to researchers and policy makers.

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9. Developments in indicators of Canadian farm family well-being: the importance of family definition

Cally Abraham, Katrin Nagelschmitz and Verna Mitura [1]

Abstract

The purpose of the paper is to explore the Canadian farm population within the larger social context using a large longitudinal general population data set, the Survey of Labour and Income Dynamics (SLID). As farm family members increasingly earn income in the non-farm economy, the traditional farm family has become more difficult to distinguish from other families. Therefore, determining what is meant by 'farm family' is important in the current economic environment. The paper compares income variables for seven different types of family. The farm family definitions range from broad (those that earn some income from farming) to narrow (those whose major source of income is farm self-employment income). The non-farm family definitions include both non-farm families and non-farm self-employed families in both rural and urban areas.

The paper finds that throughout the 1980 to 2002 period, farm families broadly defined, reported higher total income compared to self-employed farm families. The average income of self-employed farm families was lower than that of rural non-farm self-employed families. However, at the median the incomes of these two family types were very similar.

Keywords: farm households, farm families, farm family income, the Survey of Labour and Income Dynamics (SLID).

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9.1 Introduction

The scope of the definition of farm families has implications for the evaluation of different agricultural issues. A narrow definition of a farm family based on its dependence on agri-

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cultural income may be appropriate for the evaluation of farm income support issues, while a broader definition aimed at anyone who owns agricultural land may be more suitable for other types of issues including those related to environmental stewardship.

The focus of this paper is the possible delineations of farm versus non-farm families. The impact of the delineation is illustrated through comparisons of the levels and sources of income and the incidence of low income for different types of families.

Farm families differ widely in more than the share of farming income to total family income. A companion paper by Mitura et al. (2005) explores this diversity using a farm typology analysis while the analysis here addresses the significance of the definition of farm family.

9.2 The Survey of Labour and Income Dynamics

Statistics Canada launched the Survey of Labour and Income Dynamics (SLID) in 1993 (with results first published in 1996). SLID responded to the need for a longitudinal household survey that would include family income data and that would allow analysis of the interrelationships between the labour market and the family's economic well-being. It is designed to track the labour market activities, family changes and income levels of Canadians over a period of time (M. Webber, 1997).

A large longitudinal general population data set such as the SLID can provide information that will assist in addressing questions related to how farm families differ from other families in the depth and persistence of poverty, the employer attributes and job quality of farm family members who work at non-farm jobs, periods of employment or unemployment, the amount of social assistance received, and other demographic information such as age and education levels.

Methodology

This paper defines farm families using a broad and a narrow definition. The broad definition is any family that reports non-zero net farm self-employment income. In this paper these families are referred to as 'Farm families'. The narrow definition refers to economic families that report more than 50% of total income as net farm self-employment income. These families are referred to as 'Self-employed farm families'.

For a relevant comparison of farm and non-farm families the definition of farm families is important, but also the non-farm group to which the farm families should be compared. Self-employed farm families (the narrow definition) should be comparable to non-farm self-employed families living in rural areas. Urban non-farm self-employed families are also included for comparison. Non-farm self-employed families are economic families in which more than 50% of total income comes from non-farm net self-employment income.

Since about two-thirds of farm families operate a farm located in a rural area, 'non-farm' or 'other' families are further categorized according to whether they live in a rural or urban area. Urban areas are defined as areas with a population of 1,000 or more and a

population density of at least 400 persons per square kilometer. Rural areas are all areas that are not urban areas.

This paper compares the incomes of families in total and by source and the percentage of families in low income for each of the different types of family. The comparisons are undertaken for both the year 2002 and for the time period 1980 to 2002. All income amounts are expressed in 2002 constant dollars. The income levels and sources of these family types are compared statically (in 2002) and over the 1980 to 2002 period to see how the situation may have changed over this twenty year period. Comparison of income on average and at the median is used to control for the influence of very high income earners within any given family type. All income is compared on an after-tax basis.

This paper focusses on income as a measure of well-being. However, it is recognized that income only gives a limited picture of well-being and the wealth of families is an important part of the picture, particularly when the comparison involves farm families as most own assets required for production of agricultural commodities. The companion paper by Mitura et al. (2005) provides an analysis of the relationship between income and wealth levels of farm families.

Survey of Labour and Income Dynamics (SLID),
Statistics Canada, 2004

'The samples for SLID are selected from the monthly Labour Force Survey (LFS). The SLID sample is composed of two panels. Each panel consists of two LFS rotation groups and includes roughly 17,000 households. A panel is surveyed for a period of six consecutive years. A new panel is introduced every three years, so two panels always overlap.

SLID defines households and families according to the living arrangements on December 31 of the reference year. Family income is the sum of income of each adult in the family. Adults are defined in SLID as individuals 16 or older as of December 31st of the reference year. Family and household membership is defined at a particular point in time, while income is based on the entire calendar year. The family members or 'composition' may have changed during the reference year, but no adjustment is made to family income to reflect this change.

Economic family type refers to either economic families or unattached individuals. An economic family is defined as a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage common law or adoption. An unattached individual is a person living either alone or with others to whom he or she is unrelated, such as roommates or a lodger.

The major income earner is important for the derivation of detailed family types. For economic families, the major income earner is the person with the highest income before tax. For persons with negative total income before tax, the absolute value of their income is used, to reflect the fact that negative incomes generally arise from losses 'earned' in the market-place which are not meant to be sustained.'

Table 9.1 Number of families, by family type, Canada, 2002

		Estimated number	Percentage of all families
Farm families	Farm families	251,043	3.1
Non-farm families	Non-farm families	7,779,626	96.9
	Rural non-farm	1,448,745	18.0
	Urban non-farm	6,330,881	78.8
	All families	8,030,670	100.0
Self-employed families	Self-employed farm families	40,008	0.5
	Rural non-farm self-employed	64,442	0.8
	Urban non-farm self-employed	278,386	3.5

Source: Statistics Canada, Survey of Labour and Income Dynamics.

Table 9.2 Estimated number of families, by family type, Canada, 1982, 1992, 2002

		1982	1992	2002	% change 1982 to 2002
Farm families	Farm families	299,344	287,203	251,043	-16.1
Non-farm families	Rural non-farm	982,119	1,107,566	1,448,745	47.5
	Urban non-farm	4,780,591	5,463,174	6,330,881	32.4
	All families	6,062,054	6,857,943	8,030,670	32.5
Self-employed families	Self-employed farm families	96,201	61,630	40,008	-58.4
	Rural non-farm self-employed	51,195	48,820	64,442	25.9
	Urban non-farm self-employed	166,621	198,218	278,386	67.1

Source: Statistics Canada, Survey of Labour and Income Dynamics.

9.3 Results

9.3.1 Average and median income after-tax

Table 9.3 shows the median and average after-tax income of families by family type. Farm families broadly defined, reported average and median income in 2002 at $60,389 and $51,889 respectively, a level somewhere between rural non-farm and urban non-farm families. The more narrowly defined farm families, 'self-employed farm families' reported average and median income less than farm families at $56,236 and $44,086 respectively. The average income of both types of farm family was much lower than non-farm self-employed families both rural ($69,694) and urban ($79,003).

Although there is a big difference between farm and non-farm self-employed on average, income at the median is almost the same for farm and other self-employed families in rural areas. This is probably the influence of self-employed professionals who earn relatively high incomes compared to other self-employed groups (Culver et al., 1990).

Table 9.3 Average and Median after-tax income, by family type, Canada, 2002

	Average after-tax income ($)	Median after-tax income ($)	Difference ($)
Farm families	60,389	51,889	-8,500
Rural non-farm	55,445	49,427	-6,018
Urban non-farm	64,354	57,370	-6,984
All families	62,623	55,710	-6,913
Self-employed farm families	56,236	44,086	-12,150
Rural non-farm self-employed	69,604	44,398	-25,206
Urban non-farm self-employed	79,003	57,607	-21,396

Source: Statistics Canada, Survey of Labour and Income Dynamics.

9.3.2 Family income 1980-2002

Figure 9.1 shows that in 2002, the average income of farm families was approximately 97% of the average income of all families, just slightly more than that of self-employed farm families. The average income of farm self-employed was at 95%, compared to 110% for rural non-farm self-employed families.

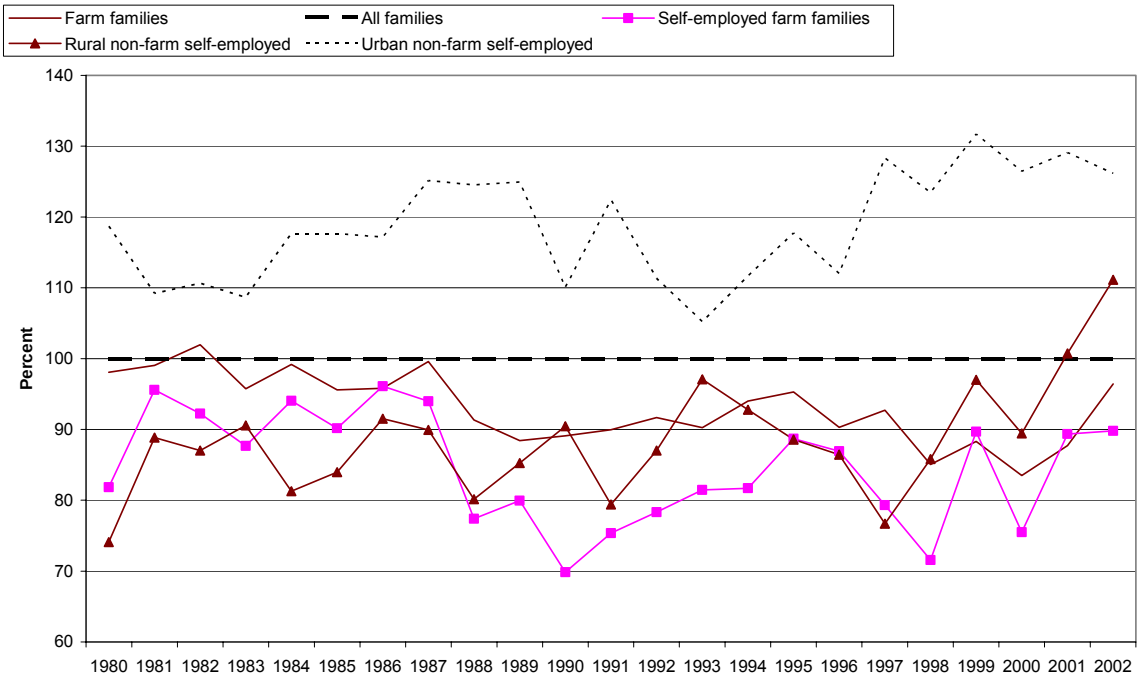
Over the 1980 to 2002 period, the average income of non-farm self-employed outpaced that of farm self-employed. The increase in the income of rural non-farm self-employed families may be partly a result of methodological changes introduced in 1996 with the SLID, however the beginning of the SLID also coincides with the beginning of an economic recovery period. Part of the explanation may be due to the growth of communities on the outskirts of urban areas, which although defined as rural may have a high degree of integration with nearby urban centers and therefore greater access to the increased opportunities available in these urban areas.

Median income after-tax

Figure 9.2 shows that the median income of farm families was about 93% of the median income of all families in 2002. This compares to self-employed farm families with income at about 80% of the level of all families, which was the same as other self-employed families living in rural areas in five of the seven years from 1996 to 2002.[1]

Over the 1980 to 2002 period, the income of farm families at the median fluctuated between just over 90% to about 85% of the income of all families. In comparison, the median income of self-employed farm families was lower and fluctuated more, between 70% to just over 80% over this period. The median income of other self-employed was similar to farm self-employed during the 1996 to 2002 period.

[1] Data for rural non-farm self-employed families is not available for the 1980 to 1995 period.



Figuur 9.1 Average after-tax income of families as a % of income of all families, by family type, Canada, 1980-2002

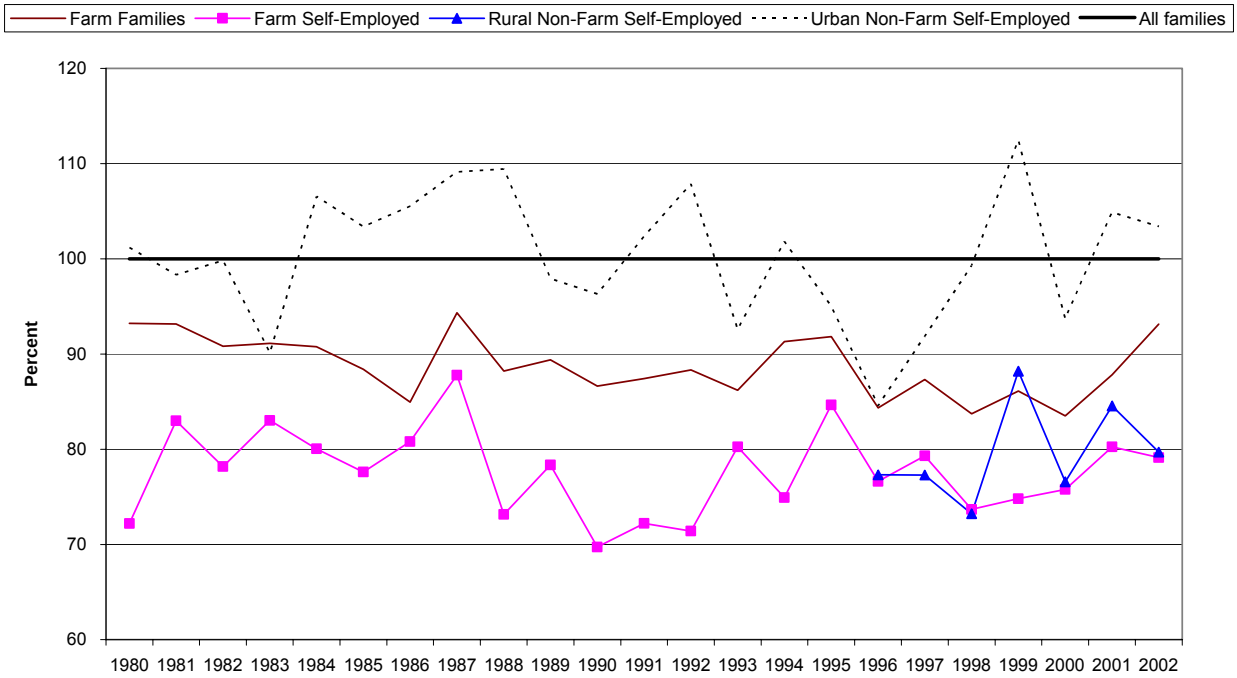


Figure 9.2 Median after-tax income as a percentage of income of all families, by family type, Canada, 1980-2002

9.3.3 Family income by source

The average income of farm self-employed families was lower than farm families more broadly defined throughout the 1980 to 2002 period. At the same time, the income of farm self-employed families was higher than other self-employed families throughout most of the 1980's. However, while the income of rural and urban non-farm self-employed rose steadily over this period, that of farm self-employed remained the same.

Table 9.4 shows the percentage of families of each type reporting each type of income. A relatively high percentage of families of all types reported income from wages and salaries, ranging from 48% for self-employed farm families to 67% for other self-employed families to 86% for urban non-farm families. A smaller percentage of both types of farm family reported wage and salary income and the average level of income from this source was also lower relative to comparable families. This may be indicative of constraints to earning wage and salary income for farm families including those associated with time and distance and those resulting from lack of off-farm employment opportunities.

Another observation is that a higher percentage of both types of farm family report investment and 'other' off-farm income compared to all other family types. This may be indicative of investment and income strategies employed by farming families that differ from other types of families. Farm families may receive rent from owning land; they may also have a higher propensity to save as a risk management strategy.

Further evidence of this may be found in the observation that among self-employed families in general, a smaller percentage of farm self-employed report wage and salary and non-farm self-employment income. However, a larger proportion of farm self-employed report other sources of income and the average amount earned from each was also larger: a larger percentage reported net investment income, government social transfers and retirement pensions.

Also worth noting is that although the percentage of both farm and self-employed farm families reporting 'other' off farm income was much larger than for other family types, the average amount reported from this source was less. This may be a result of withdrawals from Net Income Stabilization Accounts (NISA)[1] which are included in this category.

Table 9.5 shows the level of family income by source on average and at the median. On average, farm families reported 13% of total income from farm self-employment, while farm self-employed families reported 73% of income from this source. The share of income from farm self-employment is very similar to the share of income from non-farm self-employment earned by other self-employed families in both rural and urban areas (75 and 76% respectively).

Although the average income earned from self-employment was much lower for farm than for other self-employed families in rural areas, the level of income at the median was slightly higher.

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[1] The Net Income Stabilization Account (NISA) is a Canadian agriculture program designed to stabilize farm income. Producer and government contributions were deposited into an account which could then be withdrawn if a payment was triggered due to a decline in farm revenues.

Table 9.4 Percentage of families reporting, by source of income, by family type, Canada, 2002

	Farm families	Rural non-farm	Urban non-farm	Total family type	Self-employed farm	Rural non-farm self-employed	Urban non-farm self-employed
Farm self-employment income	100	-	-	3	100	-	-
Wages and Salaries	77	80	86	85	48	67	66
Non - farm self employ income	22	19	19	19	12	100	100
Net investment income	69	44	52	52	59	44	51
Government transfers	83	88	80	81	87	79	75
Retirement pensions	23	21	21	21	9	7	5
Other income	40	23	25	25	39	16	18
Total income	100	100	100	100	100	100	100

- = nil or zero.
Source: Statistics Canada, Survey of Labour and Income Dynamics.

Table 9.5 Average family income, by source, by type of family, Canada, 2002

	Farm families	Rural non-farm	Urban non-farm	Total family type	Self-employed farm	Rural non-farm self-employed	Urban non-farm self-employed
Farm self-employment income	9,200	-	-	9,200	48,800	-	-
% farm self-employment	13	n/a	n/a	n/a	73	n/a	n/a
Non-farm self employ income	15,900	20,600	25,100	24,200	4,900	61,700	79,100
% non-farm self-employment	n/a	n/a	n/a	n/a	n/a	75	76
Wages and Salaries	51,300	52,000	68,300	66,100	14,400	19,900	27,300
Net investment income	8,500	3,000	4,200	4,300	5,000	3,900	4,700
Government transfers	9,200	10,700	8,700	9,000	6,100	5,500	4,300
Retirement pensions	19,100	16,800	22,000	21,300	16,200	14,700	13,500
Other income	5,800	5,100	5,800	5,700	2,500	3,500	4,200
Total income	72,400	60,800	78,200	76,100	66,900	82,700	104,100
Tax paid	12,000	9,600	14,000	13,500	10,700	18,800	24,900
After tax income	60,400	51,200	64,200	62,600	56,200	63,900	79,200
Tax rate	16.6	15.8	17.9	17.7	16.0	22.7	23.9

- = nil or zero; n/a = not applicable; * A share of the income attributed to off-farm wages and salaries may be farm wages and salaries paid to family members other than the farm operator(s). For farm families, this may result in overstating the amount of income reported as off-farm wages and salaries.
Source: Statistics Canada, Survey of Labour and Income Dynamics.

Table 9.6 Median family income, by source, by type of family, Canada, 2002

	Farm families	Rural non-farm	Urban non-farm	Total family type	Self-employed farm	Rural non-farm self-employed	Urban non-farm self-employed
Farm self-employment income	1,200	-	-	1,200	36,400	-	-
% from farm self-employment	2	n/a	n/a	n/a	76	n/a	n/a
Non-farm self employ income	4,000	8,000	8,800	8,700	600	33,900	50,000
% from non-farm self-employment	n/a	n/a	n/a	n/a	n/a	72	76
Wages and Salaries	39,600	47,200	61,000	58,800	12,100	14,100	19,500
Net investment income	1,300	600	600	600	900	600	500
Government transfers	6,500	9,100	5,400	5,800	4,800	2,900	2,400
Retirement pensions	13,800	12,000	17,600	16,600	8,000	7,000	9,500
Other income	900	1,200	1,300	1,200	600	1,500	1,400
Total income	59,700	52,500	67,600	65,300	47,700	47,300	66,100
Tax paid	7,800	6,900	10,200	9,600	3,600	4,500	8,500
After tax income	51,900	45,600	57,400	55,700	44,100	42,800	57,600
Tax rate	13.1	13.1	15.1	14.7	7.5	9.5	12.9

- = nil or zero; n/a = not applicable; * A share of the income attributed to off-farm wages and salaries may be farm wages and salaries paid to family members other than the farm operator(s). For farm families, this may result in overstating the amount of income reported as off-farm wages and salaries.
Source: Statistics Canada, Survey of Labour and Income Dynamics.

9.3.4 Self-employment income 1980-2002

Figure 9.3 shows that the percentage of income earned from self-employment on average did not change significantly for self-employed families of all types between 1980 and 2002. For farm families more broadly defined this percentage declined from about 30% in the 1980's to 20 to 25% throughout the 1990's to just over 10% beginning in 1996. The decline beginning in 1996 is largely attributable to the methodological changes introduced with the SLID in 1996. The decline from 1988 to 1995 is probably a 'real' decline in the percentage of income earned from self-employment for these farm families.

Average and median income from self-employment, 1980-2002

Figure 9.4 shows that the average income from self-employment increased more for non-farm self-employed families than for farm self-employed between 1996 and 2002. Before 1988, average self-employment income for farm and other self-employed in rural areas was almost the same.

The median level of income from self-employment held steady between 1980 and 2002 for all self-employed families (figure 9.5). Income from self-employment was the same at the median for farm and rural non-farm self-employed families. Again, once controlled for the effects of high income earners the incomes of farm self-employed do not

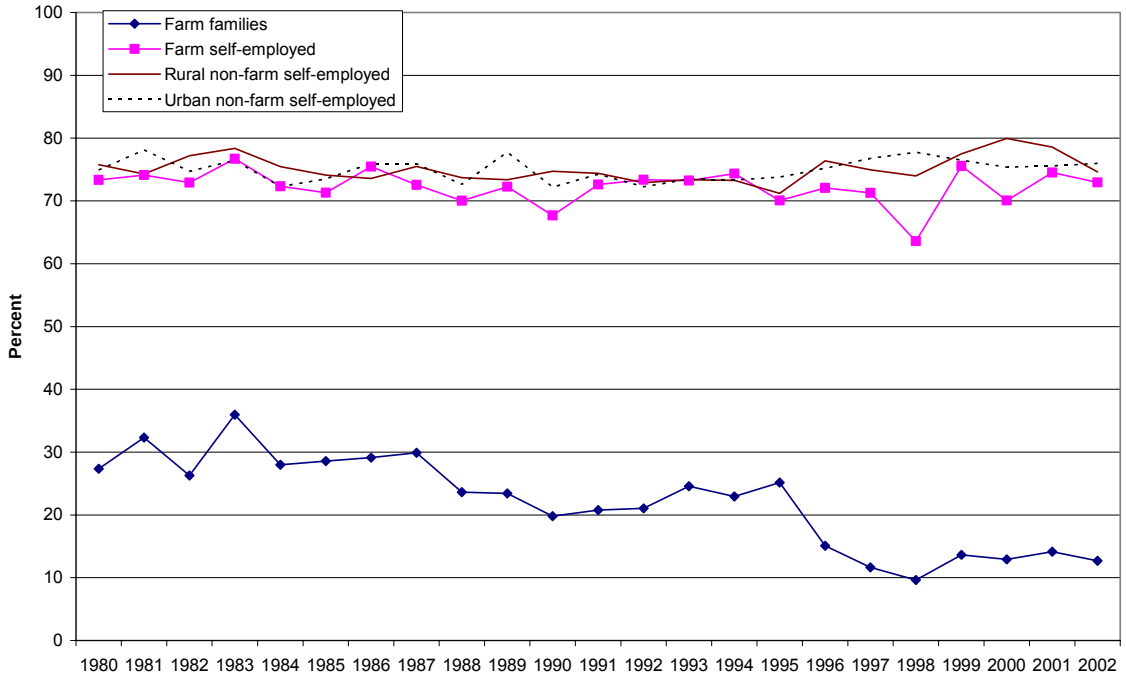

Figure 9.3 Self-employment income as a percentage of total family income, by family type, Canada, 1980-2002

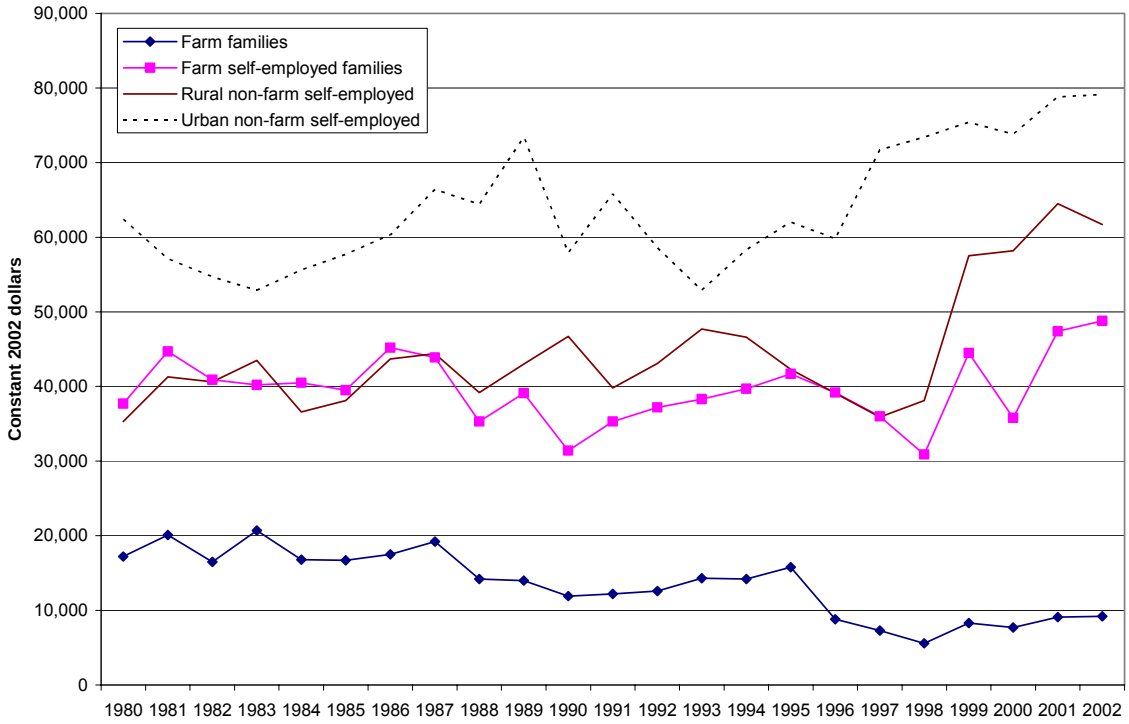

Figure 9.4 Average income from self-employment, by type of family, Canada, 1980-2002

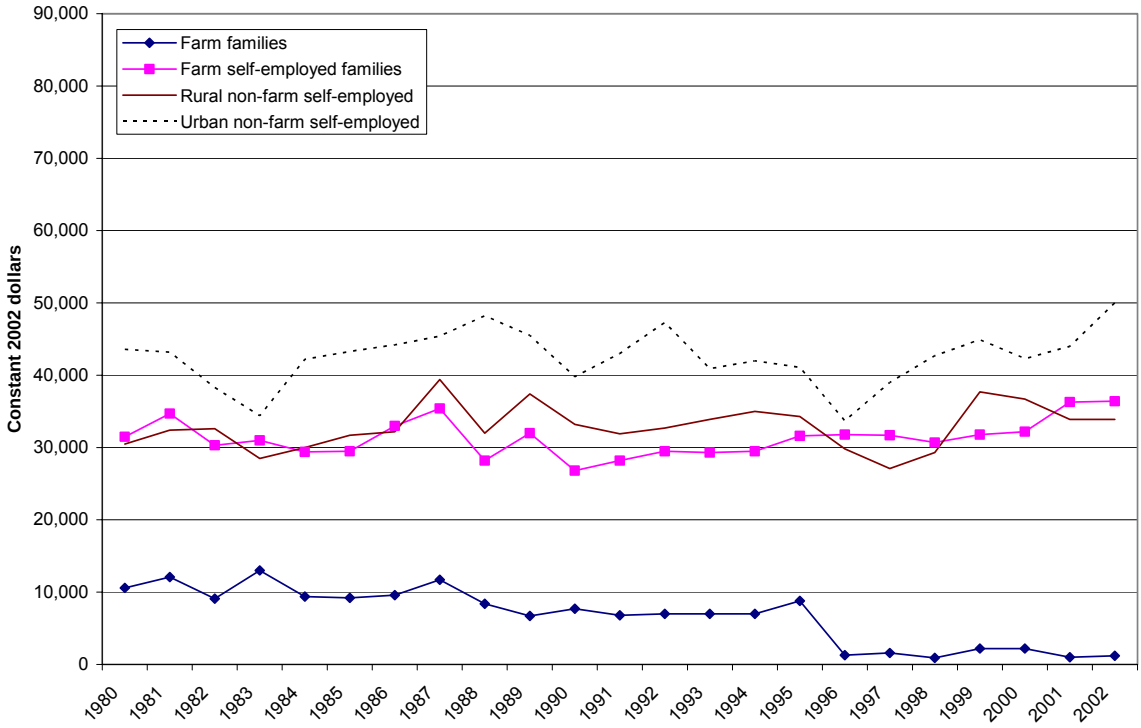

Figure 9.5 Median income from self-employment, by family type, Canada, 1980-1992

differ significantly from other self-employed, particularly those in rural areas. Again, the decline in median self-employment income between 1995 and 1996 for farm families is mainly due to changes introduced to the survey in 1996.

9.3.5 Families in low income

The Low Income Cut-Off (LICO) calculates a threshold level of income at which a family would be spending 20 percentage points more than the average family of similar size and living in a similar size of community, on basic necessities (food, clothing and shelter). The LICO's are widely used as a relative measure of low income, but they have no official status as poverty lines.

The prevalence of low income for farm families in 2002 (4.2%) was between that of rural (3.5%) and urban (5.6%) non-farm families. The low income rate for self-employed farm families (6.9%) was slightly lower than that of other self-employed families in rural areas (7.4%). The prevalence of low income for self-employed families in urban areas was the highest of all family types in 2002 (13.5%).

As figure 9.6 illustrates, the low income rate for farm families declined from a high of approximately 12% in 1984 to a twenty year low of 4.2% in 2002. The low income rate for rural non-farm families was much lower than for farm and urban non-farm families, it also declined over this period from close to 7% in the early 1980's to 3.5% in 2002. The low income rate for urban non-farm families remained stable throughout the 1980 to 2002 period, fluctuating within the 6 to 8% range.

Table 9.7 Prevalence of Low Income, by type of family, Canada, 2002

	Number of families in low income	Percentage of families in low income
Farm families	10,593	4.2
Rural non-farm	51,260	3.5
Urban non-farm	356,235	5.6
All families	418,088	5.2
Self-employed farm families	2,754	6.9
Rural non-farm self-employed	4,744	7.4
Urban non-farm self-employed	37,707	13.5

Source: Statistics Canada, Survey of Labour and Income Dynamics.

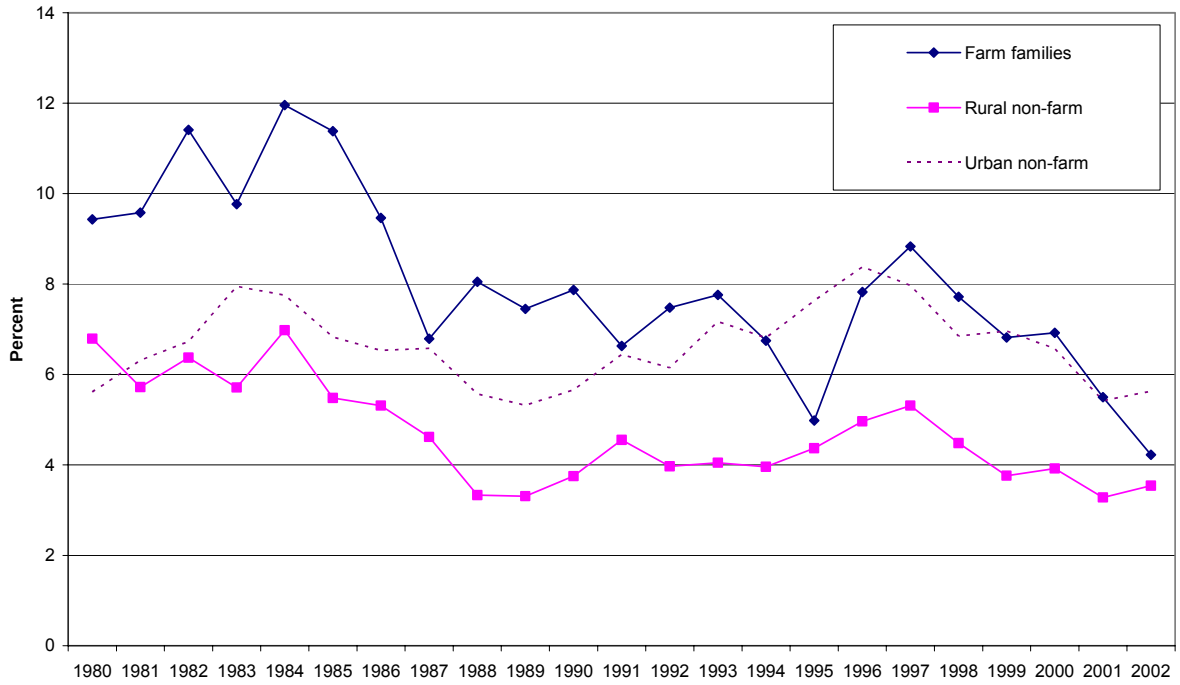

Figure 9.6 Percentage of families with income below the low-income cut-off by type of family, Canada, 1980 to 2002

9.4 Summary and Conclusions

Despite the limitations of a small sample, some useful information can be found in a comparison of farm families with families in the rest of society using the Survey of Labour and Income Dynamics (SLID).

Families who reported some farm income represented a very small percentage (3%) of families in Canada and the number of these families declined 16% between 1982 and

2002. Of all families, about 40,000 fit the definition of self-employed farm families; they reported more than 50% of their family income from farm self-employment income. These self-employed farm families accounted for 0.5% of all economic families in Canada and their number declined by almost 60% between 1980 and 2002.

Compared to all farm families, farm families that were relatively more dependent on farm income reported lower income on average and at the median throughout the period 1980 to 2002. Although the average incomes of all families rose in the 1996 to 2001 period, those of farm families both narrowly and broadly defined did not keep pace with the increase in income observed for other family types. However, at the median the trend in income of self-employed farm families was stable and very similar to rural non-farm self-employed families. This is because the category 'non-farm self-employed' includes categories of self-employed in other sectors of the economy that report higher income, such as self-employed professionals. These higher incomes would influence the average, but have no effect at the median.

Looking at income by source, the percentage of income from self-employment, on average, over time revealed that farm and other self-employed families in both rural and urban areas reported a similar share of income from self-employment. Income earned from self-employment was lower on average for farm self-employed compared to rural non-farm self-employed, but the level was the same at the median.

A smaller percentage of both types of farm family reported income from wages and salaries and the average amount they reported from this source was lower than other family types. There could be any number of reasons for this, farm families may face more constraints to earning wage and salary income compared to non-farm families, such as time required for operation of the farm, and distance from employment opportunities.

A larger percentage of farm families reported investment income and the income earned from this source was higher. Farm families generally also reported a higher level of average and median income from government social transfers and retirement pension income. Farm families may report higher investment income because they own more assets required for operation of the farm and/or because they have a higher propensity to save as a risk management strategy.

Most important when looking at families in low income is that the low income rate for farm families was similar to rural and urban families in 2002. However, the low income rate for farm families, in particular, but also for rural non-farm families, declined steadily over the 1980 to 2002 period. Of the families that continued to be defined as farm families in 2002, a smaller percentage reported income below the low income rate than was the case twenty years previously.

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Appendix A Comparison of data sources for farm family income statistics in Canada - 2001

	Census of Agriculture 2001		FFS	NISA/TDP	SLID	
Type	Census of Agriculture	Census Ag-Pop Linkage	Sectored	Administrative	Economy-wide	
Includes	All Census farms classified as family farms.	All Census families on unincorporated farms with more than $2,500 sales of agricultural products.	Unincorporated and Incorporated Farms with $10,000 or more gross farm revenue.	Families operating a single unincorporated farm with total farm operating revenue of $10,000 or more.	Economic families (excluding lone-parent families) in which the major income earner reports non-zero net farm self-employment income.	Economic families (excluding lone-parent families) in which more than 50% of total family income comes from net farm self-employment income.
Number of families	241,940 Proprietorship: 142,915 Unwritten partnership: 54,090 Written partnership: 16,080 Family corporation: 28,855	187,770	Total: 164,896 Sole proprietorship: 93,362 Partnerships: 38,277 Corporations: 24,354 Co-op and Communal: 428 Other: 222	148,560	287,367	49,483
Average Total Family Income in 2001		64,160	Total - 84,661 Sole proprietorship - 61,291 Partnerships: - 81,852 Corporations: - 179,941	72,674	72,400	66,900

10. Farm typology based on implied farm strategies

Hennie van der Veen and Karel van Bommel [1]

Farm organization, and the balance between the household and the farm have changed. This paper explores the relation between the organizational form and strategy of Dutch farmers and shows that strategy and structure are related. Legal persons and partnerships with multiple households can be especially found among the farmers focusing on economies of scale. One-man businesses and the one household partnerships more often show diversification strategies. One-man businesses are relatively more encountered amongst the life style farmers, whilst one household partnerships are stronger present amongst rural entrepreneurs.

Keywords: family farm, household, legal form, strategy, typology

10.1 Introduction

Farm organization, and the balance between the household and the farm have changed in the last years. Originally the concept of the organization of the farm was predominantly characterized by the owning family providing all the inputs of labor and capital for the farm: land would be in full ownership and other capital and labor would be fully provided by the family. In this organizational form there was no use of contractors. Over time this paradigm has shifted, as 'family farms' started renting land, using bank loans and hiring personnel and contractors to make more efficient use of machinery. The treadmill of the cost squeeze and the fact that the current farms are smaller than what should be the optimal farm size, lead to changing farm strategies such as part-time farming, on-farm cheese making and other forms of food processing and retail. Although these strategies are not totally new, incentives for entrepreneurial activity is increasing as the EU-support for standardized bulk products and production processes is slowly disappearing in favor of rural development plans.

Due to these changes, farm size and the agricultural production no longer define the farm typology entirely. Aside from the established typology the USA (USDA, 2000), Canada (Hopkins, 2004) and the Netherlands (Silvis, 2001; De Bont, 2005) are now using a typology, which is also defined by farm strategy. This paper depicts the most commonly encountered strategy/structure matches of farms in The Netherlands and describes what policy makers can gain from these observations for the formulation and implementation of their policy strategies.

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10.2 Strategies

Through the past decades, farmers have developed various strategies to survive the treadmill of the cost squeeze. This paper focuses on the following strategies:

- efficiency of scale: technological progress, be it in larger/more efficient machines or information technology, helps to increase labor productivity and further increases the dimension of what should be considered as the optimal size of the farm. Growth is usually a necessity to maintain economies of scale. Dairy farmers for example have to keep investing in milk quota, because productivity of cows grows with an average of 2% per year. To keep making optimal use of the housing system, farmers have to buy or lease milk quota regularly. Large-scale farmers make the highest net investments (De Bont, 2005), the implicit effect of which is that large scale farms are expanding. As technological development progresses, the optimal size of farms grows, which in turn requires the need to expand. Large-scale farmers generally realize economies of scale. De Bont (2005) shows that the large farms have more European Size Units (ESU) per € 1 million of book value when compared to other farms;
- environmental entrepreneurs: diversification in agricultural niche markets with a focus on environmental aspects such as nature management and organic farming. For these farmers, the sustainable use of natural resources is more important than maximizing agricultural output;
- rural entrepreneur: diversification in farm related niche markets. The farm activities of the rural entrepreneur are usually too small to provide a sufficient income. Instead of increasing the farm size, they engage in non-agricultural niches, which are related to the farm. Some start a shop on the yard to sell their own products, others go into recreational activities, like the setting up of camping sites, organizing excursions or starting a health-care center on the farm. Rural entrepreneurs usually have land-based farms, like dairy farms or arable farms. Some farmers also offer contracting services to make more optimal use of machinery;
- life style farmers: farming provides them the opportunity to live in the countryside. The main source of income doesn't arise from the farm, but from other activities such as off-farm occupation or investing capital in assets. For farms that are no longer able to compete with lower margins per unit of production and larger production units, joining the labor market by taking a part-time job can provide a decent alternative to forming a full income. Also some agricultural activities can simply be combined with other farming activities in a part-time approach (e.g. poultry fattening or cereal growing), as they are not necessarily a day filling or year-round activity. In the case of the farmers' spouse, it could be attractive not to join farm work at all, but to stay in her own profession, reaping the benefits from his/her investment (sunk cost) in human capital. Making off-farm investments with cash flows generated by the farm can also provide an attractive secondary source of income. This can also include putting unused buildings to use for non-agricultural purposes (e.g. renting them out to store caravans or to house a car repair shop);
- stopper: should it become clear that the farm is most likely not to find successor, stopping the farming activity can be an attractive option. In the Netherlands it is no

longer common practice that a son or a daughter takes over the farm. Only 39% of the farms with an entrepreneur over the age 50 years have a potential successor (Silvis 2001). The structure of these farms usually changes when the farming practice is approaching its end. Farmers also minimize their investment. Sometimes they partially sell off the farm, i.e. milk quota or land that is inconveniently located. These farmers generally keep up the practice on a small scale until the end, because they consider it as their way of life. Consequently, most farms of stoppers are characterized by more extensive types of farming, possibly renting out their old barns and greenhouses for storing caravans. It is highly unusual that they sell the complete farm at once. What's more is that the selling of the farm in pieces usually realizes a higher value in aggregation than through selling it as a whole in one instance.

In farm typologies used in Canada and the USA the stopper (retirement farms) and lifestyle farms are also recognized, but the farm typologies are identified solely by the amount of turnover. In this paper we take the typology a step further by also identifying the rural entrepreneur and the environmental farmer. We used the following indicators to characterize the strategy of the farms in the Dutch FADN[1] 2003.

- large-scale farmer: The farm is larger than 200 European Size Units (ESU);
- environmental farmer: At least €10,000 of environmental subsidies received or organic farms;
- rural entrepreneur: At least €50,000 of revenue from: recreation, electricity production, fabrication of dairy products (like cheese), domestic selling of products and the agricultural contracting business;
- life style farmer: Smaller than 100 ESU and the income from labor, renting out of privately owned assets and revenue of liquidities (including savings and stock, calculated as 5% of the average value in the year 2003) of at least €25,000;
- stopper: The most senior entrepreneur is over 55 years of age and the age difference between the senior and the youngest entrepreneur is no more than 20 years.

These strategies are not exclusively applicable to a single farm. A stopper can for instance also be characterized as an environmental farmer. Figure 10.1 shows the distribution of the strategies in the Netherlands under the indicators mentioned above. More than 16% of the farmers can be regarded as stoppers and about 14% of the farmers have large-scale farms and focus on economies of scale. Less common strategies are life style farmers, rural entrepreneurs and environmental farmers.

[1] The Dutch FADN contains a sample from the Farm Structure Survey. The survey field is defined as farms between 16 ESU and 1,200 ESU. This can have an influence on the result, as the largest and the smallest farms are not represented. Probably many life style farmers can be found with the smallest farms, while we might miss some farmers that focus on large scale economies.

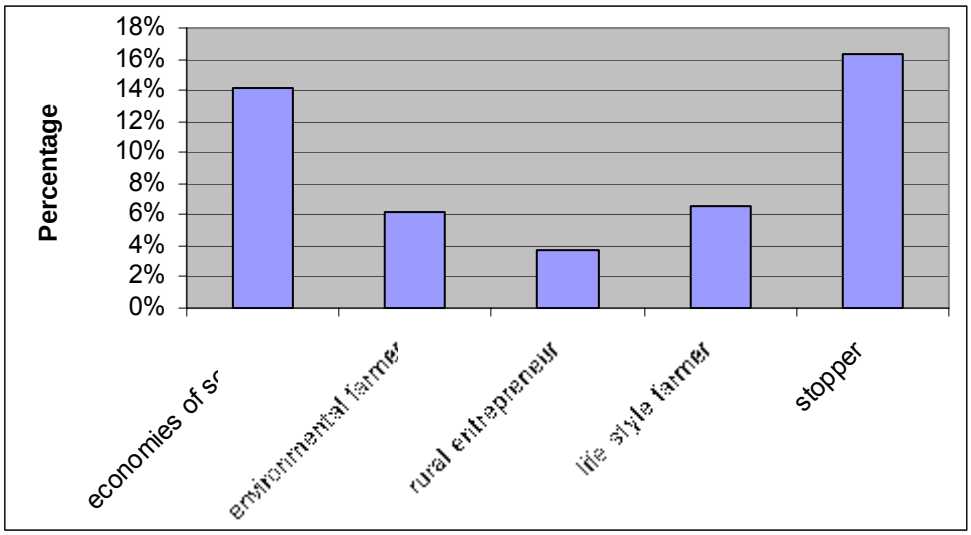

Figure 10.1 Distribution of Strategies in the Netherlands 2003
Source: Dutch FADN.

10.3 Organisational form and structure

Many farming operations, at least in the Netherlands, are becoming more complicated. Some have moved into other enterprises than the traditional farming activities. In arable farming there are several farms that rent or rent out land on a seasonal basis, to be able to specialize and reach efficiencies of scale in one crop. Many farms now consist of two or three farm entrepreneurs. These are often father-son or spouse combinations, which could be due to fiscal or emancipation reasons. This construction can involve only one household, but sometimes two or even several households. The organizational forms and structures of farm encountered can be characterized by:

- size: the size of an agricultural farm is expressed in European Size Units (ESU). The number of ESUs is calculated by using standards per hectare crop or an animal. These standards are based on the gross margins. Another indicator for size is acreage or turnover;
- the legal structure: A juridical title used to run a commercial operation. Sometimes a holding has more than one legal structure. For example in the Netherlands, a farm can have a legal father-son partnership on an operational basis, whilst a part of the land is owned by the father under his private ownership and rented out to the partnership. Likewise the son is also sometimes the full owner of recently bought milk quota. In fiscal terms there are three operations with their own fiscal income;
- household and family members: there could be several individuals living together under one roof behind a single agricultural holding. They are either employed on the farm or could be owners. Besides employing direct family members, some (large) farms also work with personnel. Unraveling these family relationships is of great value. Most commonly the situation is encountered wherein the successors (the next generation in the family) can be employed on the farm or be partly owner, whilst either (still) living with his/her parents or having started a household of his own.

Needless to say is that households can also have members that work on the farm, but are not owner. Including employment of members of the household in the family farm implies that the farm income has to support several workers. In situations where this is not possible you find that some households have members with an off-farm job, or another fixed income source like a pension, social security payments or revenues from capital investments. It could also be that he/she runs a self-employed business (through an independent legal structure) that is totally separated from the agricultural holding;

- modernity: The age of the fixed assets expressed as the book value of the assets divided by the replacement value;
- solvency: The share of equity in the total assets;
- age of oldest farmer. The most senior entrepreneur usually has a big influence on the chosen strategy of the farm. Quite often you see that the successor chooses a different strategy after the farm take-over.

The farms in our dataset are divided in four categories of organizational structures:

- one-man businesses;
- partnerships with one household (for example father and son before take-over);
- partnerships with multiple households (for example two brothers);
- private limited company.

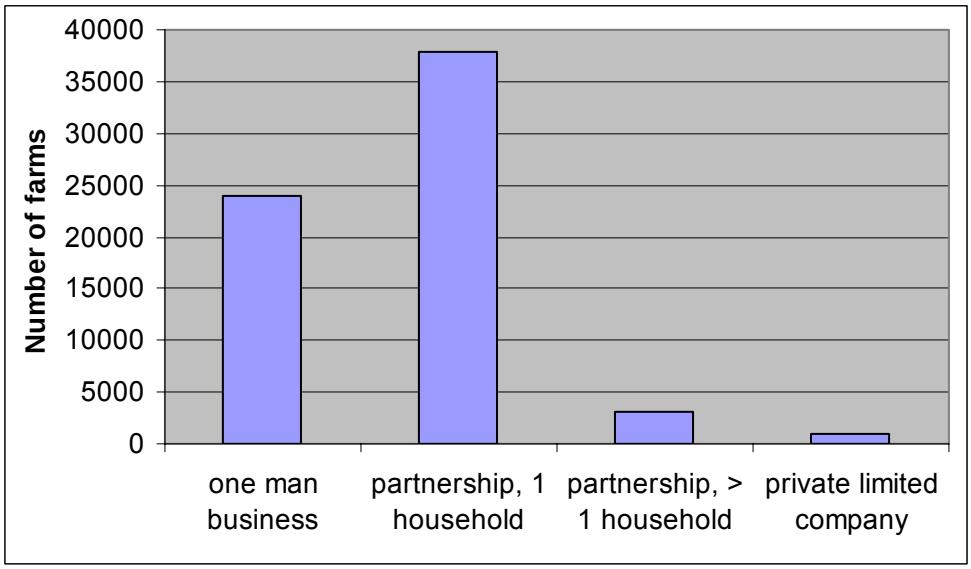

Figure 10.2 Distribution of Legal Structures in The Netherlands, 2003
Source: Dutch FADN.

Figure 10.2 shows the occurrence of legal structures of farms in the Netherlands. As you can see, the most important legal structure is the partnership. In most cases, the partnership is between partners of the same household, either with spouses or with parents and children, who are still living at home. A farm has to be rather large to support more than

one family. The partnerships with more than one household are usually partnerships between father and son (with his own household). Only rarely do two siblings run a farm together, only 2.6% of the farms has more than 1 potential successor (Statistics Netherlands). The private limited company is not commonly used in the Netherlands. A farm has to be (very) large should it be fiscally interesting to establish a private limited company.

10.4 Organisational form and strategy

The organizational form and the choice of strategy are related to each other. Traditional organizational forms no longer suffice due to adoption of more complex strategies. On the other hand farm structures notably influence the choice for a certain strategy.

Figure 10.3 shows the distribution of strategies in relation to the mentioned legal organizational forms. The right-most column shows the distribution of organizational structures of all the types of farmers. Most obvious is that rural entrepreneurship is stronger represented in the partnership with one household than one finds on average. Not surprisingly, the one-man business is less commonly encountered in the strategy of economies of scale in the same comparison, while the private limited companies and larger partnerships are more commonly found. As stated before, large-scale farms generate enough income for multiple households.

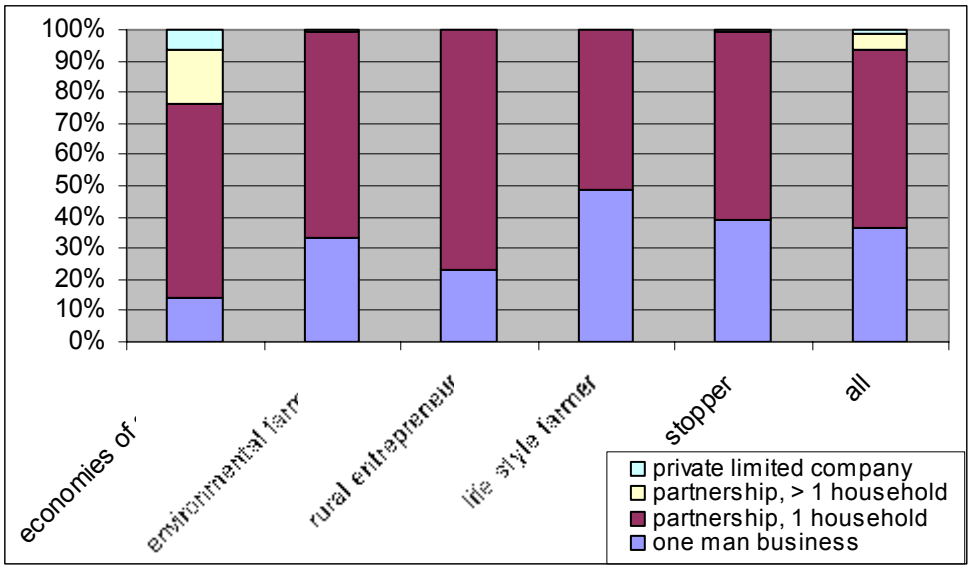

Figure 10.3 The Distribution of Legal Status and Strategies 2003
Source: Dutch FADN.

Figure 10.4 shows the economic size (ESU) of the farms of the different strategies. The fact that life style farmers are smaller than average and farms focusing on economies of scale are larger than average, is partly due to the assumptions made for characterization of the farms in the database. However, it is interesting to observe that the rural entrepre-

neur, the environmental farmer and the stopper are about the same size, although smaller than average, at least in economic size.

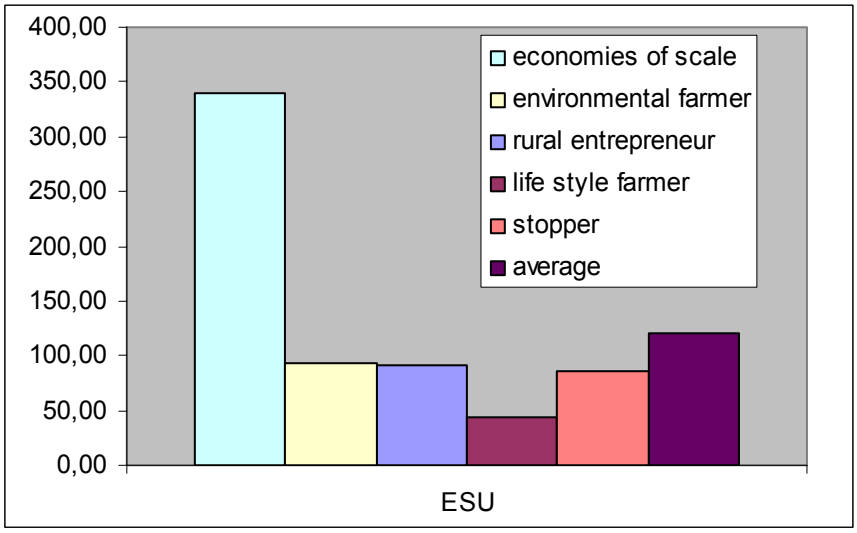

Figure 10.4 Economic Size of Farms in The Netherlands 2003
Source: Dutch FADN.

Environmental farmers operate on about the same size of land as the farms focusing on economies of scale (figure 10.5). There are many farms with horticulture under glass and intensive livestock production with limited acreage, amongst the large-scale farmers. Large-scale farms are in ownership of more than half of the land, whilst environmental farmers rent more than half. Environmental farmers are more extensive than farmers focusing on economies of scale. What's more is that they often rent land, with limited rights of use, from nature conversation organizations. It is remarkable that the stoppers are smaller than the average farm, expressed in economic size, while they have a larger than average acreage. This is due to the fact that stoppers usually opt for less intensive production systems, e.g. less intensive crops and beef cattle instead of dairy cows. Life style farmers have the smallest acreage and almost all their land is under full ownership.

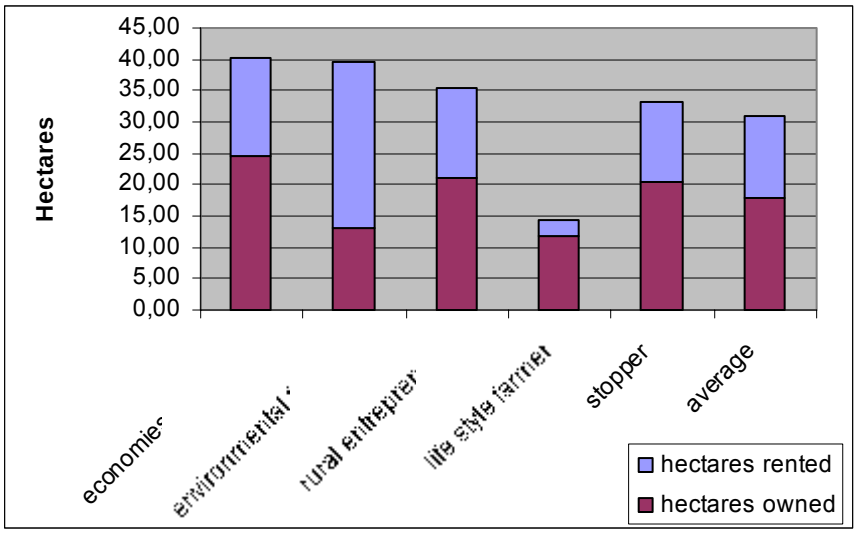

Figure 10.5 Acreage expressed in Hectares Rented and Owned 2003
Source: Dutch FADN.

On average large scale farms have a work force of 6, while the overall average is only 2 (figure 10.6). Most farmers only use about one labor unit of own labor. Mostly large-scale farms make use of lots of external labor, however the rural entrepreneur and environmental farmers also rely on external labor to a certain extent. Life style farmers, not surprisingly, make little use external labor.

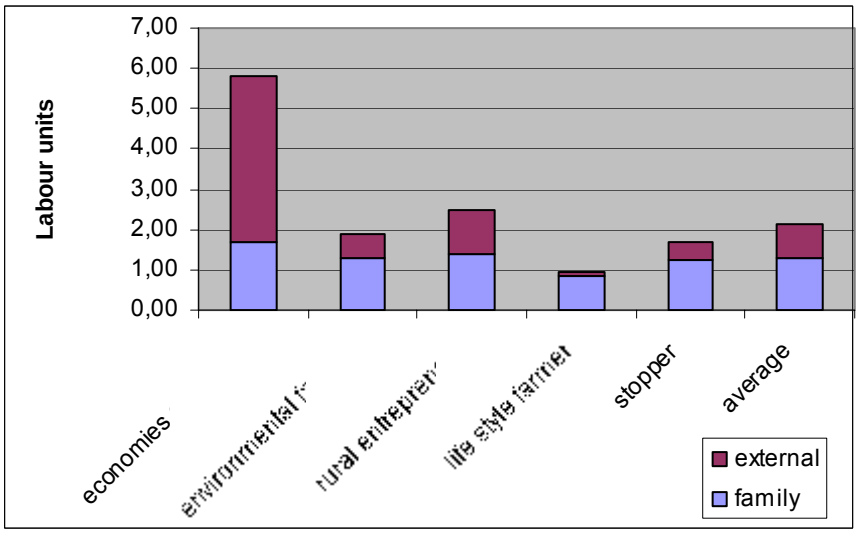

Figure 10.6 Family and External Labor Units
Source: Dutch FADN.

Other farm characteristics mentioned are modernity, solvency and age of the most senior entrepreneur. Figure 10.7 depicts that (as we would expect) the modernity of stop-

pers is far below average. Rural entrepreneurs and large-scale farmers have the most modern farms. However the last group of farmers is more leveraged than the rural entrepreneurs, leading to lower solvency. On average environmental farmers are younger than the other groups of farmers. Part of the explanation for this phenomenon lays in the fact that many organic farms have been founded just after a successor has taken over the farm (Van der Veen, 2004). What's more is that currently half of the organic farms were founded after 1995.

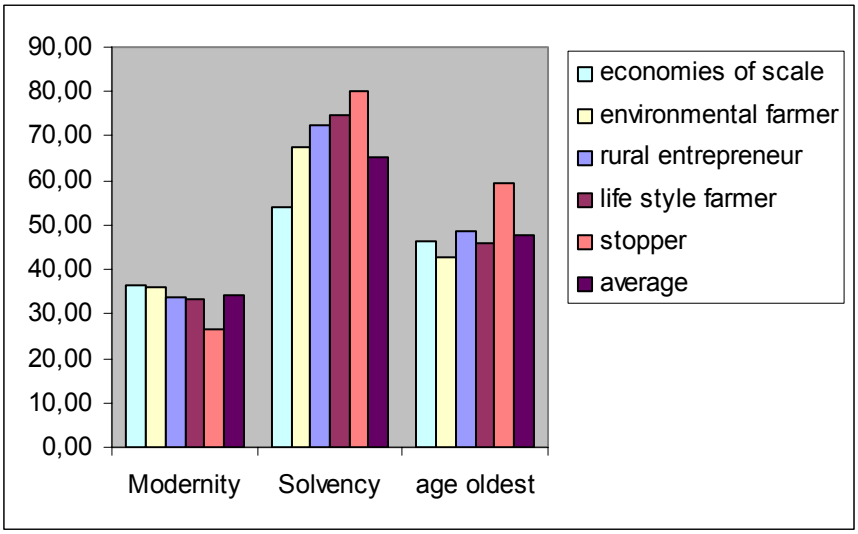

Figure 10.7 Characteristics of the Farms According to their Strategy
Source: Dutch FADN.

10.5 Policy and strategy

The EU agricultural policy has had a big influence on the farm strategies. The direct support on products secured the income of farmers, as it guaranteed a minimum price for products. On average, the farmers with product support did not grow as much as the farms without product support made apparent for instance when one compares the intensive livestock sector (both no support) and horticulture under glass. Many farms that received product support now lack an optimal farm structure. With the decoupling of direct support subsidies and the rural development plans, EU governments are attempting to incite the environmental farmer and the rural entrepreneur, making farms become more integrated into the general society. Farmers now receive subsidies for nature conservation plans and setting up of new rural activities.

This policy change will make these two strategies more interesting to adopt. The number of farms with the strategy of environmental farmer or rural entrepreneur is expected to grow, but they will stay niche markets. The farms with economies of scale strategies have to compete more and more on the global market. According to Massink (2002) not all sectors will be able compete on a global market, especially arable farmers and farmers with beef cattle will have to face fierce competition. Not all farms will be able

to survive in this strategy, some will adopt other strategies, like engaging into niche markets, while others will sell the farm all together. For example dairy farms in the Netherlands, which are obligated to move due to town and country planning, buy up complete arable farms on a new location to start a bigger dairy farm. They can benefit from a better structure of the farm (size and location of parcels) and the newest technologies in the stable.

10.6 Conclusions

Given the continuous cost squeeze and the changing EU agricultural and rural policy, farmers are incited to change from traditional farming with a focus on low cost to other strategies. For farmers with a focus solely on farming, economies of scale is still the main strategy. However, strategies as rural entrepreneurship and environmental farming can also be encountered. For these farmers, their activities are still related to farming and are contributing to the countryside. Life style farmers, on the other hand, do not focus on farming anymore, but generate income from off-farm labor or capital.

This paper shows that strategy and structure are related. Legal persons and partnerships with multiple households can be especially found among the farmers focusing on economies of scale. One-man businesses and the one household partnerships more often show diversification strategies. One-man businesses are relatively more encountered amongst the life style farmers, whilst one household partnerships are stronger present amongst rural entrepreneurs and to a smaller extent amongst the environmental entrepreneurs.

The acreage of the environmental farmer is about the same size of the acreage of the farms focusing on economies of scale. The difference is that environmental farmers rent a larger share of their land. Life style farmers hardly rent land and mainly rely on own labor. The opposite applies to farmers focusing on economies of scale.

If we look at the other characteristics then it appears that especially younger farmers focus on environmental farming and that their farms have an above average modernity. Stoppers, not surprisingly, have the lowest modernity and the highest solvency.

Given the fact that most farms are still family farms and that the organizational structure in most cases is a given fact, it can be concluded that the choice of strategy is influenced by the organizational structure. This can provide policy makers with interesting insights. Increasing the number of environmental farmers for instance can be best stimulated by focusing on young farmers. On the other hand, life style farmers and stoppers restrict the renewing process in agriculture, as they hardly focus on continuity.

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11. Calibration for improved weighting and bias analysis in FADN surveys

Dr. Beat Meier[1]

Abstract

In the Swiss Farm Accountancy Data Network (FADN) statistical conclusions from the sample to the population are problematic because there is no random selection of the farms. A calibration approach is used in order to assess the actual bias of the estimates from this sample. The calibration model with an adjustment of biased auxiliary variables (area, age, education, organic farms) indicates a positive bias of family farm income of between 5 and 6%. The education of the farm managers is in the current sample above the average in the population and constitutes a primary cause. Calibration can contribute to improve estimates, but it is important to consider all components of total survey error in development or redesign of information systems: sampling errors, selection errors and measurement errors.

Keywords: survey errors, random sampling, biased estimation, calibration, auxiliary information, FADN, farm income.

11.1 Introduction

Until 1998, the Farm Accountancy Data Network (FADN) in Switzerland was based on a sample of so-called test farms. This sample was deliberately selected to include farms characterised by above-average economic results. However, one of the objectives of the redrafted legal mandate of 1999 was to analyse the economic situation in agriculture with a sample of representative reference farms. Starting from existing data, the aim was to achieve this objective with the 'Method 2000' package of measures. The most important methodical changes comprise the delimitation of the population, the development of a new farm typology, the introduction of a stratified selection plan and weighting of the individual farm results. However, statistical conclusions from the sample to the population remain problematic because the reference farms are not selected at random. Considerable bias must be expected for the averages estimated today. The quality of these estimates is assessed by several methodically different approaches, calibration being one of them.

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11.2 Calibration for nonresponse adjustment and bias estimation

Statistical inference from a sample to the population is possible if the probability to be included in the sample is known and different from zero for all population elements. This precondition is not fulfilled in the presence of nonresponse in random samples. The same is true for non-random sampling. Methods for the treatment of nonresponse are therefore of a special interest for the analysis of bias in the Swiss network of non-random selected reference farms.

Figure 11.1 illustrates the different sources and types of errors occurring in surveys. In non-random samples, frame errors and nonresponse errors are not distinguishable and summarised here as selection errors. The calibration approach described below is used to identify major causes and extend of bias caused by selection errors.

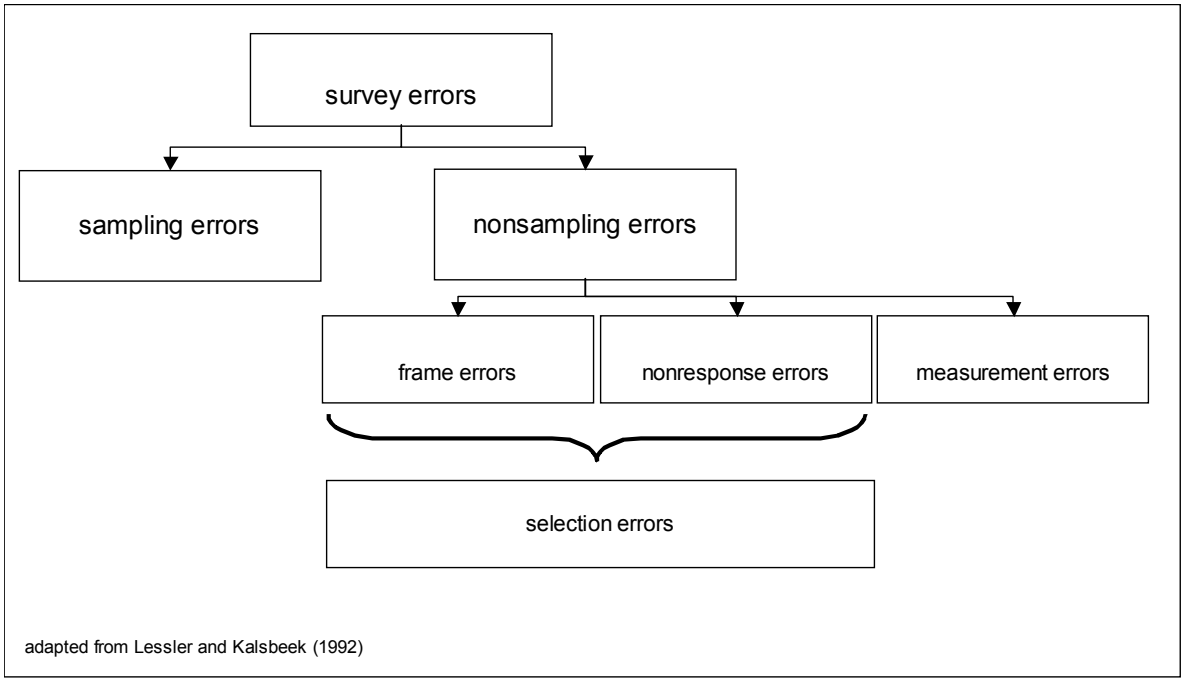

Figure 11.1 Classification of survey errors

Lundström & Särndal (2002) describe methods to handle nonresponse. On the one hand, they mention the popular two-stage-approach, where in a first step the design weights (determined before selection) are applied to the results and in a second step nonresponse weights derived from auxiliary information are used to adjust the results for missing elements. On the other hand, the authors introduce a general calibration approach that is supposed to be easier and normally not less efficient than traditional approaches. As several authors have shown, the calibration approach is equivalent to the traditional estimators like Horvitz-Thompson estimators, ratio or regression estimators (Deville & Särndal 1992, Deville et al. 1993, Bethlehem 2002 or Lundström & Särndal 2002).

The basic idea of calibration is explained here for the estimation of a population total. For a study variable Y the unknown sum Y_Σ of the population is to be estimated from a sample with n elements. All values *yi* from the sample are used with a weight *wi* in the estimation.

$$\hat{Y}_\Sigma = \sum_{i=1}^{n} w_i y_i = w_1 y_1 + w_2 y_2 + \ldots + w_i y_i + \ldots + w_n y_n$$

The individual w_i for each sampled element are determined using information from auxiliary variables. Auxiliary variables can be observed in the sample (x_i) and have (e.g.) a known population total. For an auxiliary variable X, the w_i must fulfil the restriction

$$X_\Sigma = \sum_{i=1}^{n} w_i x_i = w_1 x_1 + w_2 x_2 + \ldots + w_i x_i + \ldots + w_n x_n$$

and a distance function D between the w_i and a starting value w_{0i} is to be minimised.

$$\sum_{i=1}^{n} D(w_i; w_{0i}) = \min!$$

The w0i can be design weights or poststratification weights or a constant like 1.

Of course, more than one auxiliary variable can be used simultaneously in this approach. The w_i determined by the calibration model are used to weight the observed study variables y_i in the sample (see first formula above). The result is the estimation of the population total Y_Σ.

Different types of auxiliary variables are suited for calibration. The known population total can be the sum of a continuous variable as arable land or the number of elements with a specific value of a discrete variable like the number of farms of a specific type. It is comfortable and reassuring that the well known cases of design weights or poststratification weights can be formulated as special cases of the more general calibration approach.

For the selection of a specific distance function, Deville & Särndal (1992) or Lundström & Särndal (2002) give a comprehensive overview.

11.3 Selection of appropriate auxiliary variables: The example of education

Suitable auxiliary variables show a strong interrelation with the study variable(s) and determine differences in the probability of inclusion of a population element in the sample (see also Lundström & Särndal, 2002, p. 121).

An example for a good auxiliary variable in the context of a farm accountancy data network is the educational level of the farm manager. As figure 11.2 shows, family farm

income can be explained by the four educational levels to a great extent. At the same time, we observe considerable differences between the frequencies of these levels in the population and the current non-random sample. As shown in figure 11.3, the current weighting system based on poststratification by farm type, farm size and region only partly corrects the differences. Combining these two observations from the descriptive analysis, we expect some bias in the estimated average family farm income due to the higher inclusion probability of farm managers with a high educational level. An integration of education as an auxiliary information in the current weighting system would not be possible, as the current poststratification with 165 possible strata already produces too many empty or nearly empty strata. Calibration however allows a simultaneous adjustment of several auxiliary variables.

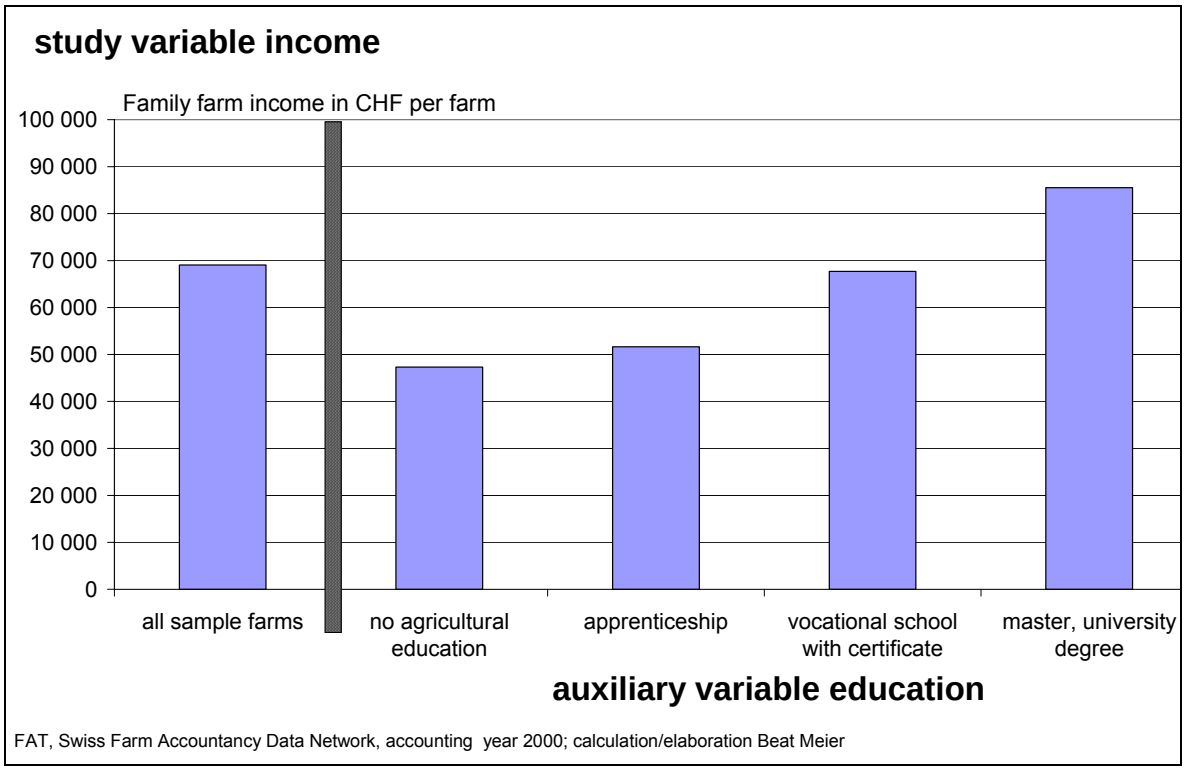

Figure 11.2 Interrelation of education and income

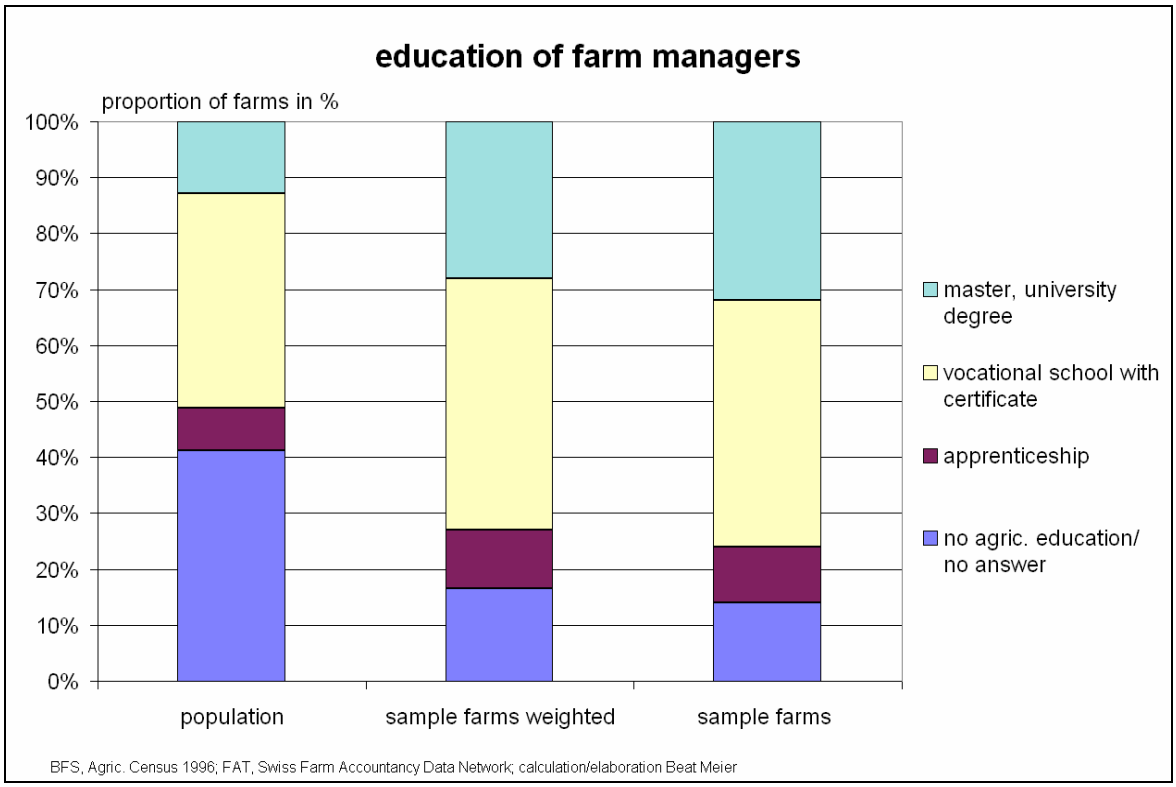

Figure 11.3 Frequencies of educational levels in sample and population

11.4 Results from a calibration of auxiliary variables in the Swiss Farm Accountancy Data Network

As one methodological approach among others, calibration is used to measure existing bias in the results of the Swiss reference farms (Meier 2005). The auxiliary variables are: farm type, farm size and region, land use for specific crops, age and education of the farm manager and the characteristic of organic production.

The distance function is an ordinary least squares approach where the original weight is a constant of 17, which corresponds to the average weight with a population of 56,624 farms and 3,419 reference farms in the year 2000.

$$\sum_{i=1}^{n} (w_i - 17)^2 = \min!$$

The model with linear constraints and a nonlinear objective function is formulated and solved with GAMS (General Algebraic Modelling System, Brooke 1998).

Five different calibration models are calculated:

Basis	Equivalent to the current poststratification by farm type, farm size and region
Land	As above, plus calibration of 7 elements of land use: (Wine, fruits, vegetable crops, sugar beet, potatoes)
Land_age	As above, plus calibration of the number of farms in 6 age classes
Land_age_education	As above, plus calibration of the number of farms in 3 classes of education levels
Land_age_education_organic	As above, plus calibration of the number of organic farms in 3 regions

Figure 11.4 first illustrates the influence of the calibration models on the distribution of the weights. In the calibration 'Basis', a majority of sample farms gets a weight close the average of 17. The dispersion increases with the number of constraints introduced into the model.

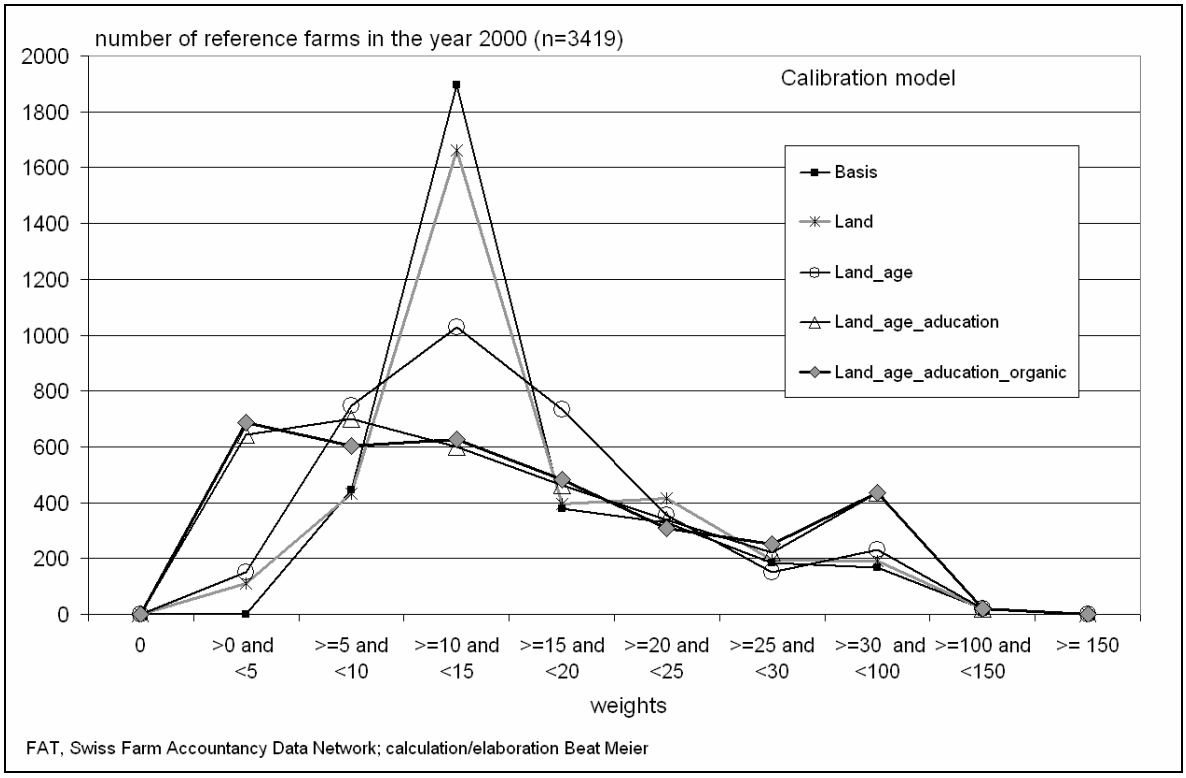

Figure 11.4 Distribution of the weights in alternative calibration systems

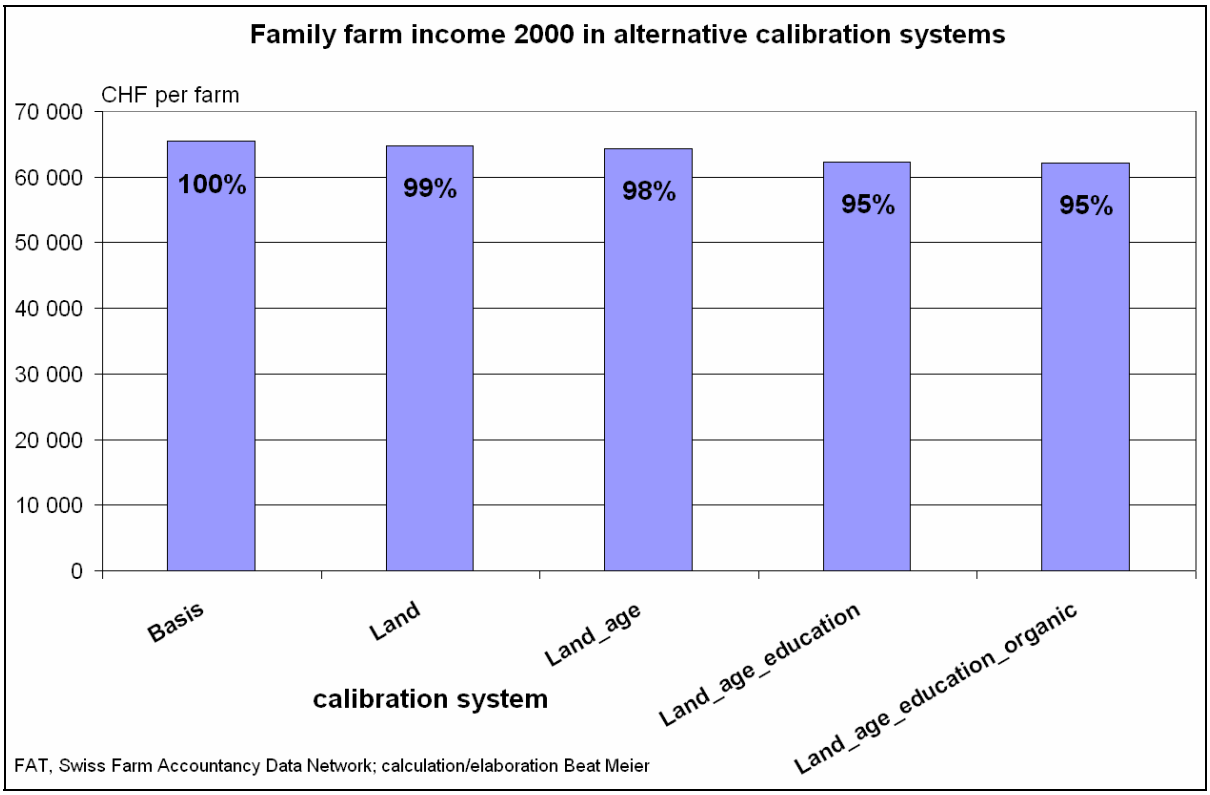

Figure 11.5 Influence of alternative calibration systems on average income

As figure 11.5 shows, the calibration of the seven land use elements and the additional adjustment for the age structure has not much influence on the estimated average income. If education is considered too, a reduction of 3% can be observed, whereas the calibration of the number of organic farms has only a minor effect. In several of these calibration systems, compensation between decreasing und increasing effects can be observed, above all for the age structure, where the under-representation of very young and of older farmers are adjusted at the same time. Whereas the effects of calibration on income seem to be limited (except for the auxiliary variable 'education'), the differences for other study variables are more important. As an example, the over-representation of organic farms in the current weighting system 'Basis' leads to an important bias of direct payments for organic agriculture (+40% in year 2000). This bias is nearly eliminated by the calibration of the number of organic farms in the three subregions.

The benefits from using calibration in estimation seem to be obvious, as existing bias can be identified and reduced. These conclusions could be misleading however, if the variance of the estimates is considerably higher compared to the estimation by poststratification weights. The variance of the estimates from the different calibration systems therefore needs to be estimated. A resampling procedure is applied (Jackknive resampling with 200 subsamples, see Meier 2005). The results in figure 11.6 show a small increase of the standard error with increasing complexity of the calibration. Having the important effects of calibration on the distribution of the individual weights in mind (see figure 11.4), we might have expected a more pronounced increase of the variance. The

moderate increase of less than 10% can be explained by the high explanatory power of the used auxiliary variables with a positive effect on the precision of the estimates as known from poststratification.

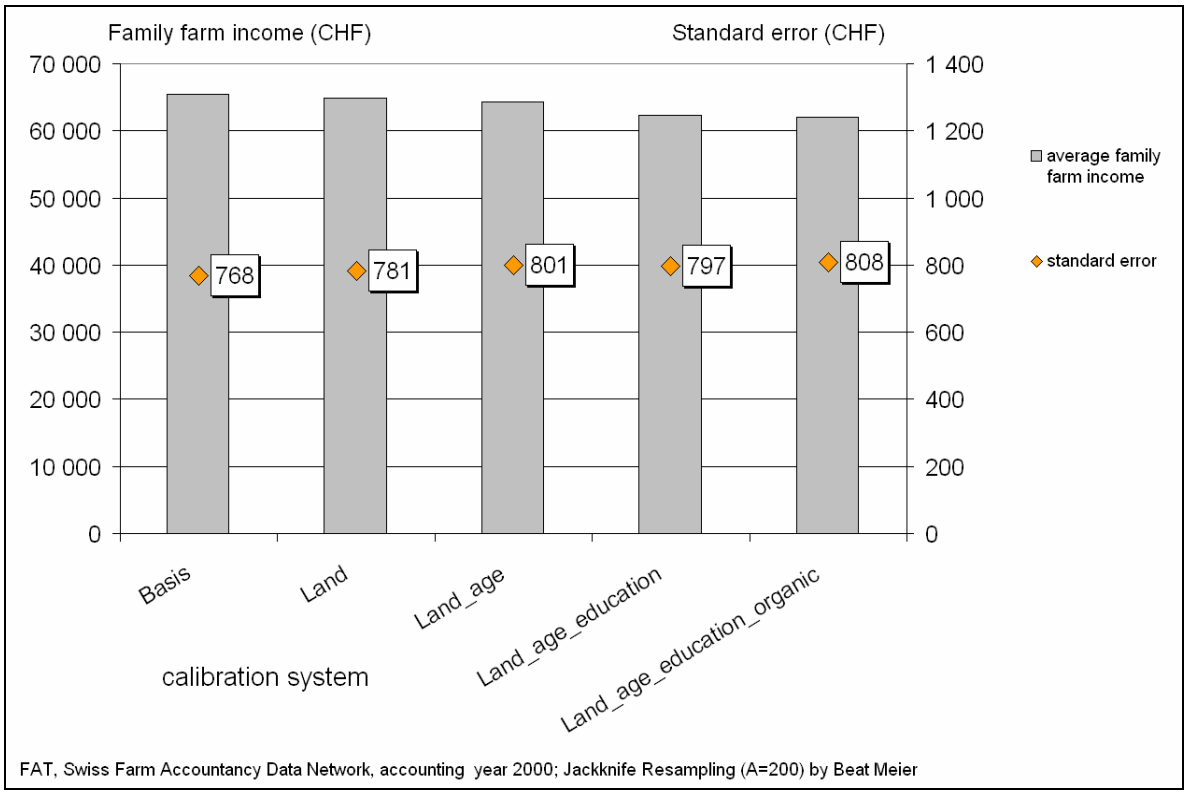

Figure 11.6 Variance estimation in calibration systems

11.5 Conclusions

Calibration is a powerful method to identify sources and to assess the importance of different bias' in FADN-results. Besides the analysis of bias, calibration could play an important role in improving estimation in FADN-analysis and to overcome some disadvantages of the current poststratification weighting systems based on farm type, farm size an region. It would be wrong however, to see calibration as a remedy for all kinds of inadequate sampling procedures. Random sampling and high response rates remain dominant factors for good estimation quality.

This paper examines selection errors occurring in a non-random sample. Any redesign of an information system like a farm accountancy data network should however consider all components of total survey error and their interactions: sampling errors, selection errors and measurement errors.

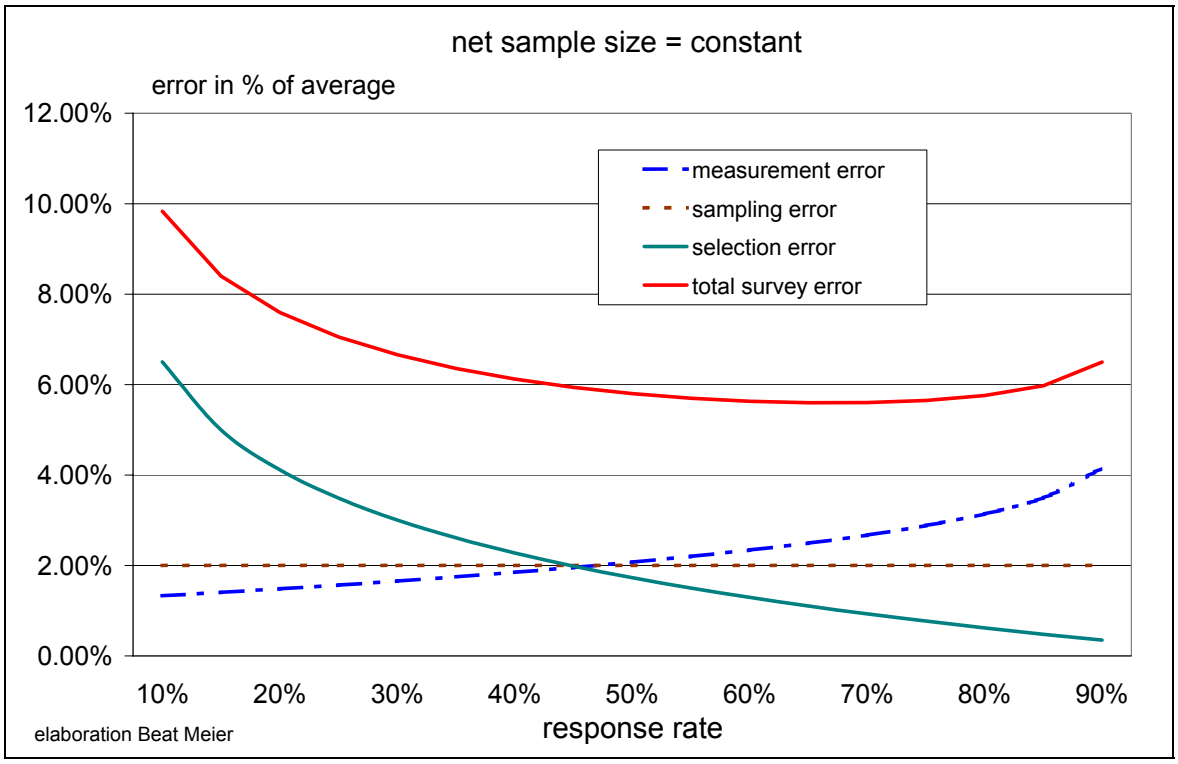

Figure 11.7 Total survey error and its components

An illustration of possible interactions is given in figure 11.7. Assuming a constant net sample size, the sampling error is expected to be constant as well. The selection error (nonresponse error) however decreases with improved response rates. Measurement errors on the other hand might show an opposite trend if the most willingly participating elements produce better data and the elements that only respond with important incentives or pressure are more likely to deliver data with measurement errors. In this case, the optimal response rate is not 100% but somewhere below.

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12. Non-response in the Dutch FADN: Qualitative reasons and quantitative impacts

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Abstract

The analyses of non-response, presented in this paper, show a slight difference between participating and non-participating farms. However, these differences are not significant. A remarkable and significant difference is found between the unsuitable and suitable farms. The farms that are considered unsuitable to participate in the system are smaller than the suitable farms. This conclusion, together with the observation that the percentage of farms considered as unsuitable differs strongly between the recruiters, leads to the recommendation to make the criteria for unsuitable farms more explicit and to improve the communication about these criteria.

12.1 Introduction and problem statement

In the Dutch Farm Accountancy Data Network (FADN), accounting information of 1,500 horticultural and agricultural farms is collected. Not only financial economic information, but also technical economic information is gathered. Every year, farms are asked to participate in the system in order to compensate for attrition and to take structural changes in agriculture into account. Some of the farms that are approached during the recruitment phase refuse to participate. These refusals do not cause problems if these farms do not differ from farms that participate. In case farms that refuse to participate systematically differ from the participating farms this could result in a bias. If for example older farmers are less inclined to participate, this will result in a different age distribution in the sample compared to the population. The representativeness of the data with respect to age will become questionable (whether this is a problem or not depends on the research goals and the extent to which the important variables correlate with age).

The quality of the estimates based on the sample depends on the farms that are included in the sample. This paper analyses an important aspect that determines which farms will be included in the sample, the non-response. The goal of this paper is to study the factors that have an impact on the non-response, to quanitify the size of the non-response and the occurrence of a non-response bias and to give recommendations for the future.

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12.2 Non-response in different types of farming and size classes

Table 12.1 describes the response percentages in different types of farming of the recruitment that took place in spring 2003. There are clear differences between the response percentages. For example, in arable farming more than 50% of the suitable farms are willing to cooperate. Dairy farming also shows a high willingness to join the system. Arable and dairy farming are the major sectors in Dutch agriculture. On the other site, there are types of farming with low response rates. Only 20% of the fattening pig farms are willing to cooperate. Also in horticulture it's more difficult to recruit farms, for example the response rate in the group 'flowers under glass' is only 17.4%. The total average of all approached farms is 32%. This percentage is, of course, to a large extent determined by the low-response groups. A weighted average, taking into account the importance of the different sectors, would results in a higher value.

Table 12.1 Results for different types of farming of the recruitment of FADN farms, spring 2003

Type of farming	Approached (1)	Refusals (2)	Recruited (3)	Unsuitable (4)	(3)/(1) (5)	(3)/((1)-(4)) (6)	(4)/(1) (7)
Arable	27	11	12	4	44,4	52,2	14,8
Starch potatoes	35	15	10	10	28,6	40	28,6
Arable (organic)	41	17	13	11	31,7	43,3	26,8
Dairy	95	47	33	15	34,7	41,3	15,8
Dairy (organic)	5	1	4		80	80	0
Calf fattening	67	31	17	19	25,4	35,4	28,4
Other grazing livestock	82	37	14	31	17,1	27,5	37,8
Breeding pigs	57	28	14	15	24,6	33,3	26,3
Fattening pigs	145	94	26	25	17,9	21,7	17,2
Closed pig farms	56	39	12	5	21,4	23,5	8,9
Laying hen	11	5	5	1	45,5	50	9,1
Poultry	10	4	4	2	40	50	20
Other intensive livestock	40	21	16	3	40	43,2	7,5
Combination	126	77	30	19	23,8	28	15,1
Combination (organic)	26	11	9	6	34,6	45	23,1
Vegetable under glass	111	45	38	28	34,2	45,8	25,2
Flowers under glass	82	38	8	36	9,8	17,4	43,9
Plant	11	6	2	3	18,2	25	27,3
Other glass	70	33	15	22	21,4	31,3	31,4
Vegetable in the open air	70	44	14	12	20	24,1	17,1
Fruit	137	68	28	41	20,4	29,2	29,9
Nurseries	61	29	16	16	26,2	35,6	26,2
Mushrooms	33	16	8	9	24,2	33,3	27,3
Bulbs	76	47	16	13	21,1	25,4	17,1
Other open air	80	44	14	22	17,5	24,1	27,5
TOTAL	1.554	808	378	368	24,3	31,9	23,7

(5) response rate (number recruited/number approached)
(6) response rate (number recruited/number suitable)
(7) percentage suitable (number suitable/number approached)

Table 12.2 gives a description of the response rates in the different size classes. Based on table 12.1 and the low response rates in horticulture one could expect a lower response rate in the largest size class. The results hardly show this. The response rate is slightly lower in the smallest and largest size class compared to the middle class. The percentage of unsuitable farms is clearly higher in the lowest size class. This can be explained by the fact that farms that are closing down their business or sell their business can often be found in this size class.

Table 12.2 Results for different size classes of the recruitment of FADN farms, spring 2003 f

Type of farming	Approached (1)	Refusals (2)	Recruited (3)	Unsuitable (4)	(3)/(1) (5)	(3)/(1)-(4) (6)	(4)/(1) (7)
Smallest size class	618	285	131	202	21,2	31,5	32,7
Medium size class	277	151	78	48	28,2	34,1	17,3
Largest size class	659	372	169	118	25,6	31,2	17,9

12.3 Reasons for non-response

During the recruitment phase, the recruiters were asked to clearly document the reasons brought forward by the farmers not to join the system. Content analysis was used to analyze the reasons of non-response. Content analysis is a systematic analysis of text documents (see for example Anders Ericsson en Simon, 1980; Kassarjian, 1977; Morris, 1994). In the first step the keywords that are included in the reason are identified and counted. Subsequently these keywords have been analyzed in their context and have been categorized in a logical framework. The keywords, the frequency of use of the keywords and the logical framework are displayed in figure 12.1.

In the center, all keywords are listed that relate to the data, providing access to the data and the attitude of the farmers. The elements are closely related. In the circle 'attitude', a number of keywords are given that are often used in reasons for non-response, such as lack of time, to much work and no interest. Besides, there are a number of keywords that indicate that there is a concern about the proper use and protection of their individual data.

In the circle 'providing', a number of keywords are listed that directly relate to providing access to the data. A substantial number of farmers has problems with providing data or to give access to their data to third parties. Privacy and anonymity are important keywords. Other farmers are somewhat more practical and stress the cost/revenue ratio. Participating in the FADN system would result in extra paperwork, without enough compensation for that. The perceived usefulness of participation and therefore the will to participate is low among this group of farmers. A number of farmers is willing to participate if they would receive a financial compensation for this participation.

In the circle 'information', a number of keywords is listed related to the current information. These keywords are often brought forward in the context of keywords of the

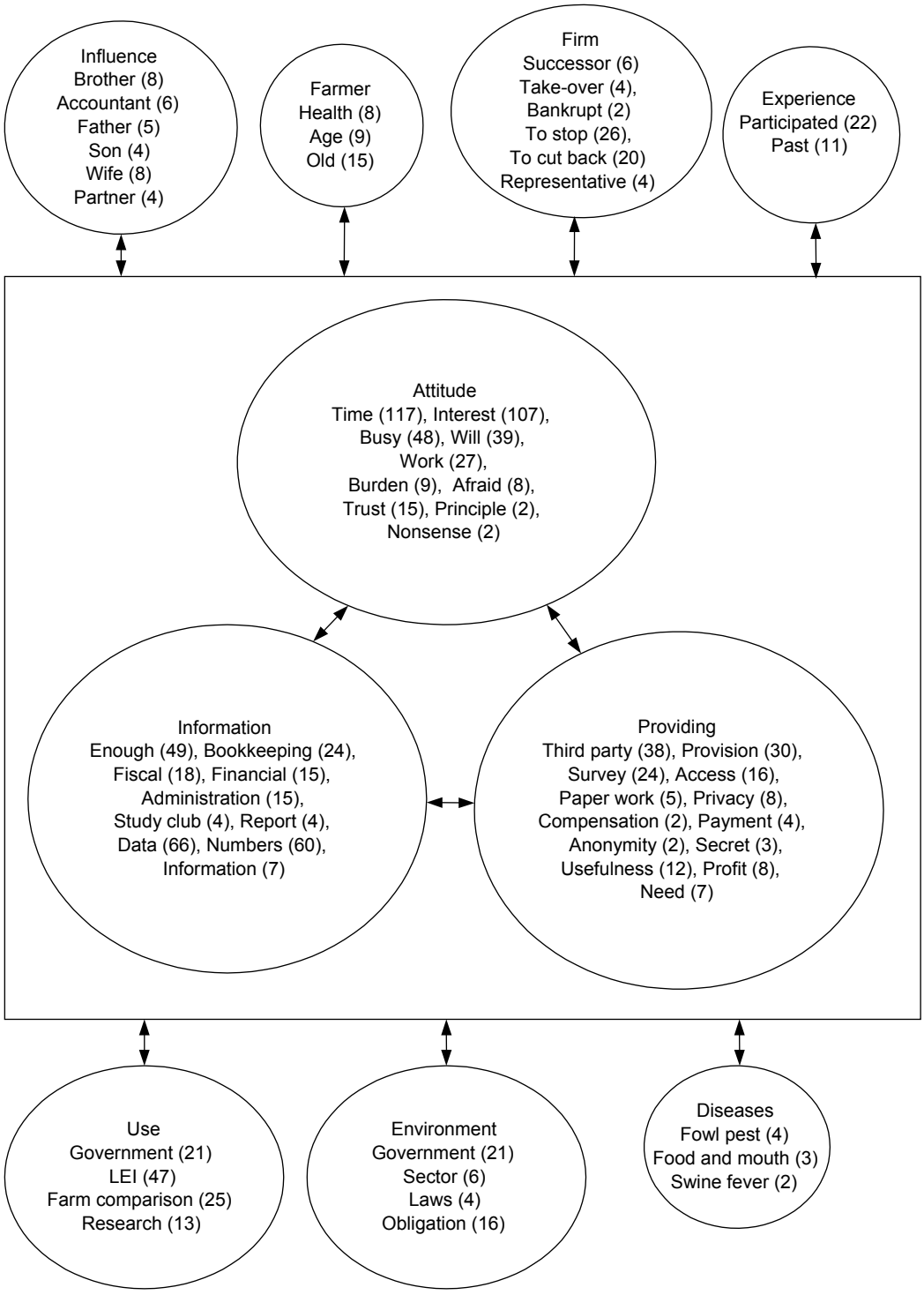

Figure 12.1 Content analysis of keywords in reasons of non-response

previous two circles. Farmers often claim to have enough information from their book-keeping, administration or study group. The usefulness of additional information is considered to be low. Furthermore, some of these farmers are not willing to give access to their information.

Besides these three core circles, there are several groups of keywords included in reasons for non-response. The first group, summarized as 'influence', reveals that farmers often refer to other people in their reason for not participating. The brother, father or wife often does not agree with participation (this of course concerns the reason as stated by the farmer; it is not clear whether it's the real perception or an easy way out). Also a number of times the negative advice of the accountant is brought forward. Another group of keywords concerns the situation of the farmer. The farmer refers to his age, or state of health for not participating. Furthermore, some farmers have experiences from the past. For some, this has resulted in negative feelings, for others it's just a reason that it's now somebody else his turn.

To develop a better understanding of the non-response a number of questions were asked to all farmers that were approached. Table 12.3 shows the results of a number of these questions. In these questions the farmer had to indicate to which extend he agrees with a statement about his knowledge or his attitude. The table shows a clear difference between those farmers who are willing to cooperate and those who are not. The ones who are willing to participate are more informed about the activities of the LEI and the existence of the FADN. The participants are also better informed about the use of the FADN data. The non participants do on average disagree with the statement that they are aware of the use of the FADN data. Providing data is considered more useful by those who are willing to participate. The opinion about the LEI with respect to the objectivity and the carefulness is better among the participants. The last question shows a very clear difference, non participants have a significant lower trust in the government.

Table 12.3 Attitude of farmers (-2 not agree till 2 agree)

	Non participant		Participant	
	average	SE	average	SE
Informed about the LEI	0,9	0,05	1,3	0,07
Informed about the FADN system	0,0	0,05	0,9	0,07
Informed about the use of FADN data	-0,4	0,05	0,5	0,07
Usefulness of FADN system	0,1	0,04	0,8	0,06
Usefulness of providing data	0,1	0,04	0,9	0,06
Carefulness of LEI	0,2	0,03	0,7	0,06
Objectivity of LEI	0,2	0,03	0,6	0,06
Trust in the government	-0,7	0,04	0,3	0,06

SE - standard error.

Discriminant analysis of the attitude of farmers shows that 'trust in the government' and the extent to which the farmer has knowledge about the FADN system are important factors in predicting the participation of an individual farmer. The trust in the government is a factor that can hardly be influenced by LEI. LEI can influence the extent to which farmers have knowledge about the FADN. Due to a better communication with the agricultural sector, the knowledge of the FADN system could be improved.

12.4 Quantitative analyses of impact non-response

Comparing the characteristics of the farms that are willing to participate with the characteristics of the non participating farms gives an idea whether responding farms are different from non responding farms. This gives an indication about the likelihood of an existence of a non-response bias, but it does not give any information about the magnitude of this bias on the estimation of a set of goal variables.

An estimation of the impact of the non-response on the goal variables is made by using data imputation (see Vrolijk, 2004 and Vrolijk and Dol, 2003). The analyses have been focused on the dairy sector, because enough observations are available in this sector.

Based on the number of dairy cows, the utilized agricultural area, the number of hectares of fodder crops and the total size of the farm an estimate is made of a set of goal variables. This estimation is made for the farms that participate as well as for the farms that do not participate. The estimations are based on the farms that are already included in the FADN sample before the recruitment in the spring of 2003. The results are shown in table 12.4.

Table 12.4 Non-response bias for dairy farming (smallest size class)

	Refusals		Recruited		Unsuitable	
	average	SE	average	SE	average	SE
Imputation-variables:						
Cows	34.3	1.7	38.0	2.1	25.0	3.2
UAA	22.7	1.3	26.1	1.7	19.9	2.3
Ha fodder	22.1	1.1	25.2	1.5	19.0	2.2
Economic size	65.0	2.9	72.8	3.5	50.6	5.2
Goal variables:						
Family farm income	28,486	4,085	31,815	4,048	19,223	5,569
Savings	5,735	3,947	10,737	3,957	-1,889	4,102
Milk revenues	82,894	6,201	102,573	8,727	60,232	9,356
N mutation	360.5	161.1	666.2	323.7	410.2	195.4
Farm result	-37,889	3,734	-36,159	4,815	-40,689	5.346
Revenues per €100 costs	71.5	3.2	76.6	3.4	66.8	2.7
Revenues per AWU	13,647	3,415	17,194	3,454	4,728	3,758

Table 12.4 gives an indication about the extent of the bias. The first rows in the table describe the difference in the structure of the farms. These numbers show that on average the participating farms are slightly bigger for all these structural variables than the farms that refuse. However, the differences are not statistically significant. The difference between the unsuitable farms with the other two categories is quite remarkable. The farms that are considered not to be suitable, for inclusion in the FADN sample, are significant smaller than the other farms.

It is interesting to see how these structural differences will affect the bias in the goal variables. The second half of the table shows estimates of the goal variables. The structural differences between participating and non-participating farms result in slight differences in the estimations of the goal variables. These differences are however not significant. Also in this case, the conclusion can be drawn that the difference with the unsuitable farms is larger than the difference between participating and non participating farms. For a number of variables, the differences between suitable and unsuitable farms are significant. These results give an indication that the subjective choice of considering a farm as suitable or unsuitable has an impact on the results. A non-response bias seems to exist, but the differences are not significant.

This estimate of the possible impact is only based on the observable variables. Therefore, these analyses do not allow any conclusions on not observable variables, such as the quality of the farm management. If participating farms would have a high (or low) level of management quality, then there could still be an impact of the non-response. The impact of non-observable variables requires further research, in which the non-observable variables have to be operationalised and measured.

12.5 Defining a farm as unsuitable

Besides non-response, unsuitability can be a reason why a farm is not included in the sample. Some of the farms are considered to be unsuitable to be included in the FADN. This decision is partly subjective and is made by the TAM (bookkeeper of the LEI). An obvious reason is the inability to reach a farmer. Another important reason is that even the most recent agricultural census sometimes turns out to be outdated.

In the recruitment of spring 2003, the recruiters were asked to clearly document the reasons why a farm is considered as unsuitable. The documented reasons were analyzed with content analyses. Just as with the non-response, the keywords have been identified, counted and put into a logical framework.

Figure 12.2 shows the keywords, the frequency and the logical dependencies. The major group of keywords is displayed in the center. All these keywords refer to a situation in which the farm has ended its operation or is scaling down. In many cases it's a valid conclusion that these farms are unsuitable for inclusion in the FADN. Of course it raises the question how many farms are included in the agricultural census that already have stopped. Based on the farms that have been approached during the recruitment process, an estimate could be made.

The category 'firm' refers to situations in which the TAM doesn't consider the firm to be an agricultural enterprise. In the past, firms have been approached which were in fact an

accounting office or even a mental institution. This also raises questions about the extent to which this happens in the agricultural census. The category 'side' refers to firms which are involved in agriculture, but where this is only one of the activities or it's only a hobby. Neglecting these type of farms is one of the reasons why smaller firms are underrepresented in the FADN sample. The strong financial entanglement of the separate activities could be a reason not to include a farm in the FADN. This reason belongs to the group 'complexity'. Different locations, entanglement with other activities, relations with activities abroad can cause a situation in which the costs and revenues of the agricultural activities cannot be distinguished.

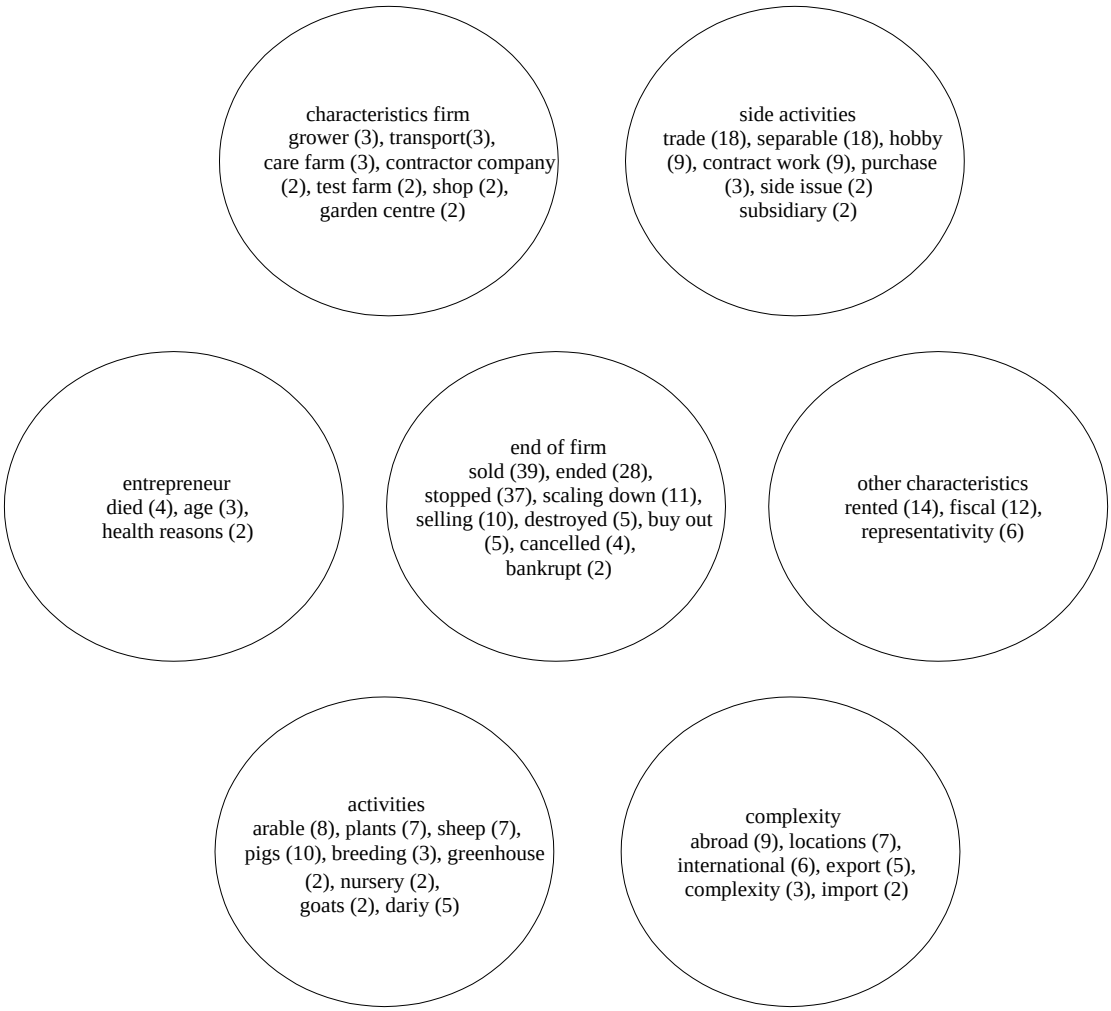

Figure 12.2 Reasons for being unsuitable

Furthermore, there are some characteristics of the entrepreneur or the firm that can lead to the judgment 'unsuitable'. The characteristics of the entrepreneur are for example age or health. Characteristics of the firm are rented out, fiscal constructions or representa-

tivity. Rented out implies that there are still agricultural activities but these are conducted by a third party. Fiscal refers to situations in which the farmer indicates that a special organizational structure has been chosen in order to achieve some fiscal benefits. This might make the financial administration more complicated. Representativity is a strange reason for not including a farm in the sample. This might indicate a lack of knowledge among potential sample units and among recruiters. One farm can not be representative, a group of farms and the diversity of farms in this group can be representative for the population.

The last category of keywords is called 'activities'. Partly these keywords describe the existence of side activities on the farm and partly the type of activities on a farm are mentioned as a reason for being unsuitable. This implies that a recruiter makes a judgment about the representativity of the activities on a farm. This judgment more or less implies that a part of the farms are excluded from the sample. This might result in biases.

12.6 Conclusions and recommendations

This paper analyses the non-response and the reasons and effects of the non-response during the recruitment that took place in spring 2003. There are clear differences in the response percentages between different types of farming. In arable farming more than 50% of the suitable farms are willing to cooperate. Dairy farming also shows a high willingness to join the system. Intensive livestock and horticulture are agricultural sectors with lower response percentages.

Analysis about the attitude of farmers show that 'trust in the government' and the extent to which the farmer has knowledge about the FADN system are important factors in predicting the participation of an individual farmer. The trust in the government is a factor that can hardly be influenced by LEI. LEI can influence the extent to which farmers have knowledge about the FADN.

The analyses of the non-response, presented in this paper, show a slight difference between participating and non-participating farms. However, these differences are not significant. A remarkable and significant difference is found between the unsuitable and suitable farms. The farms that are considered unsuitable to participate in the system are smaller than the suitable farms. This conclusion, together with the observation that the percentage of farms considered as unsuitable differs strongly between the recruiters, leads to the recommendation to make the criteria for unsuitable farms more explicit and to improve the communication about these criteria.

The data show large differences between the bookkeepers of LEI that are involved in the recruitment of farms (these results are not shown in the paper because of the privacy of employees). Differences are found in the response rates as well as the percentage of farms that are considered as unsuitable. Partly these differences can be explained by the types of farming the bookkeeper is involved in (response rate in dairy farming is for example much higher than in intensive livestock farming), but there is a significant person effect. In future years, it is therefore advisable to assign recruitment tasks to employees who enjoy doing these tasks, who can clearly communicate the importance and role of the FADN system and who are convinced about the usefulness of the system.

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13. Handbook on rural household, livelihood and well-being: statistics on rural development and agriculture household income

Table of content [1]

Preface

[1] This paper is to be included as Table of content in the Handbook on Rural Household, Livelihood and Well-Being: Statistics on Rural Development and Agriculture Household Income. The Task Force is comprised of experts from the following national agencies, universities and international organizations: Statistics Canada, Hungarian Central Statistical Office, National Statistical Institute of Italy (ISTAT), Swedish Board of Agriculture, Dept. for Environment, Food and Rural Affairs (United Kingdom), Economic Research Service (United States), Imperial College (United Kingdom), University of Verona (Italy), University of Pescara (Italy), Food and Agriculture Organization of United Nations (FAO), World Bank, Statistical Office of the European Communities (Eurostat), Organization for Economic Co-operation and Development (OECD) and the United Nations Economic Commission for Europe (UNECE).

(viii) Education and employment in rural regions
(ix) The role of tourism
(x) The importance of communications
(xi) Rural services standards
(xii) Objectives and instruments for rural policies
(xiii) New issues in rural policy-making
(xiv) The role of information and communication technology for rural development
(xv) The risks of specialization
(xvi) Rural policies
(xvii) Conclusions

I.5 Agriculture households and their role in agriculture policies
I.6 The need for statistics and indicators for monitoring rural development
I.7 The need for statistics and indicators for monitoring agriculture household income and wealth vis-à-vis other rural households and urban households

PART I
RURAL DEVELOPMENT STATISTICS

II. Conceptual framework
II.1 Definitions of rural (national, OECD, Eurostat, World Bank, etc.
II.1.1 Introduction
II.1.2 OECD
II.1.3 European Union
II.1.4 The World Bank
II.1.5 FAO
II.2 Typologies
II.2.1 OECD
II.2.2 European Union
II.3 Requirements on indicators and their assessment
II.3.1 Introduction
II.3.2 OECD
II.3.3 European Union
II.4 Themes and set of indicators
II.4.1 OECD
II.4.2 European Union
II.4.3 The World Bank
II.4.4 FAO

III. INVENTORY OF NATIONAL APPROACHES TO RURAL DEVELOPMENT STATISTICS
III.1 Introduction
III.2 Inventory of national rural development statistics
III.3 The definition of rural

14. Information System FADN Czech Republic

Ing. Michaela Lekesova, Ing. Martina Harvilikova[1]

Abstract

Information System FADN CZ is an on - line web application, it consists of four modules. The first one is for data collecting and for data analyses on the farm level. Module 2 provides data import, checking and processing of data. It ensures administration of returning holdings database and data storing. The third Module is accessible via the Internet browser. It enables an access to the database of individual primary farms' data from FADN surveys and to a database of derived farms' data. Only privileged users have access to these databases. The last Module is a portal IS FADN CZ with a database of aggregated quantitative economic and production data with the Internet access for needs of state authorities, research institutions and commercial sphere.

It is an integrated system for collecting, checking, processing, administrating, storing and publishing of FADN data. The newest part (Module 4) enables an access to a very detailed and unique database with microeconomic data from the agricultural holdings in the Czech Republic.

Keywords: Information system, database, Internet, FADN, web application, agriculture.

14.1 Introduction

Since 1995 the Research Institute of Agricultural Economics (VÚZE) organizes a survey of accountancy data from agricultural holdings. The structure of surveyed information reflects requires and needs of decision making sphere, above all requires of the Ministry of Agriculture (MoA). Adaptation of this system to the EU standards results in another extending of the content of the survey data.

At present the FADN CZ (Farm Accountancy Data Network) data are used, on the level of the MoA, for processing of the Report on the state of agriculture of the Czech Republic, for calculation of the economic result of the agrarian sector, for many periodic and operative analyses of income in agriculture basic industry and also for solutions of agrarian policy problems.

FADN CZ data are also used by the Czech Statistical Office for processing of Economic Accounts in Agriculture (EAA) and balances of agricultural commodities.

Very wide use of these data is in research projects not only in the VÚZE, but also in other research institutions and in number of international projects.

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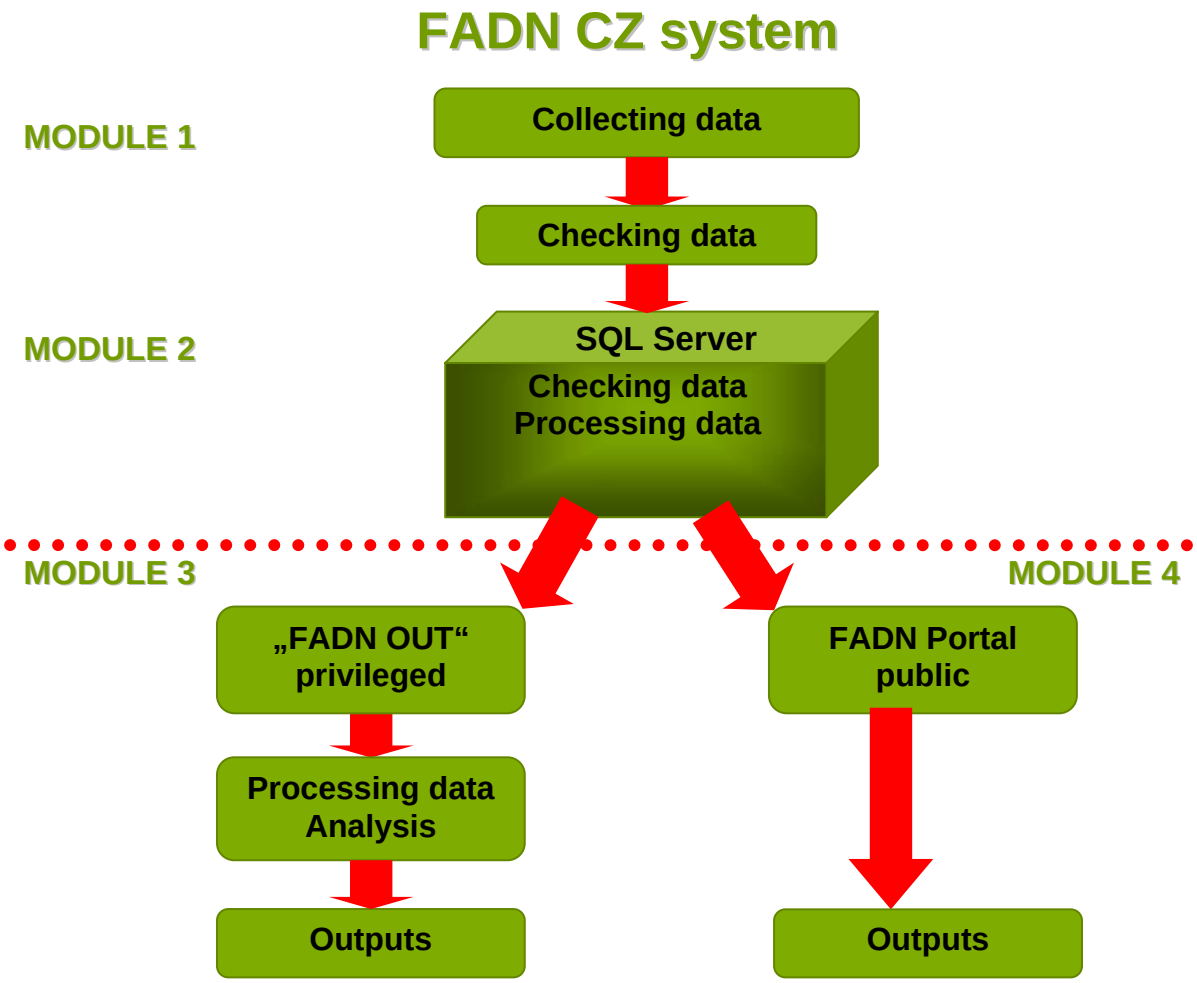
The present FADN CZ database is a result of a long - term analysis of information needs of policy makers and other users. This database enables the full harmonisation of data with the EU requirements and at the same time it takes into consideration the Czech specifics.

14.2 The structure of the IS FADN CZ

The IS FADN CZ is an integrated system used for collecting, checking, processing and utilization of the FADN database. The architecture of this system results from a procedural analyses and it is illustrated in scheme 14.1.



Scheme 14.1

The communication within this architecture between the modules and the processes is on - line via the Internet access. The system is divided into three types of networks. Extranet is a network for specific purposes for authorised users (data collecting and checking). Intranet is a network for privileged users within VÚZE (FADN OUT) and Internet for providing of public accessible data (FADN Portal).

Solving principle is 'on - line' and it is unified for all the modules:

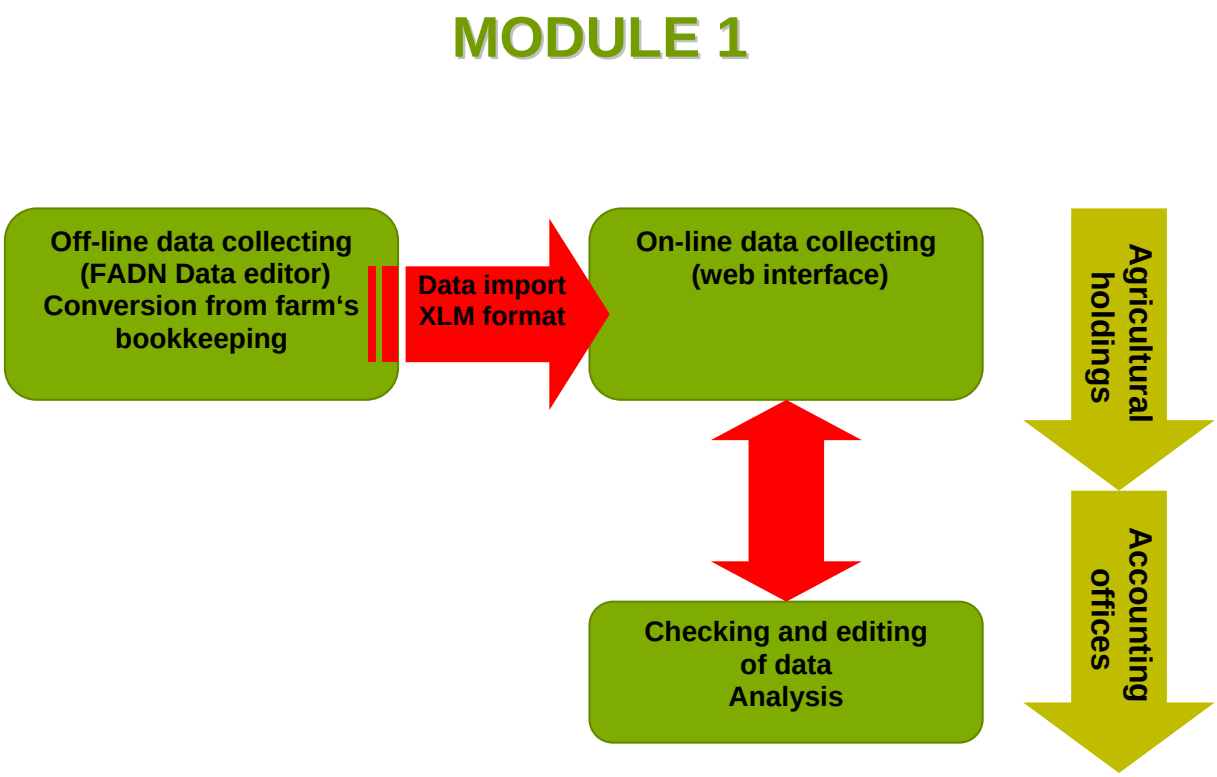
- www application with using ASP technology, JavaScript and VB Script and HTML;
- these applications work with data and with data core of the central SQL server;
- applications are installed on the central web server (IIS server);
- application runs as a client within the Internet explorer on a local PC or on a web terminal.

The first two modules are mentioned very briefly, because they were already presented in 2002. Naturally their functions are still modified, extended and updated. The basic version of the third module was created in 2003 and finishing of the last module (FADN Portal) is planning in June 2005.

14.2.1 Module 1

Basic functions implemented in the module 1:

- collecting of legal entities data according to EU and Czech regulations;
- collecting of individual farms data according to EU and Czech regulations;



Scheme 14.2

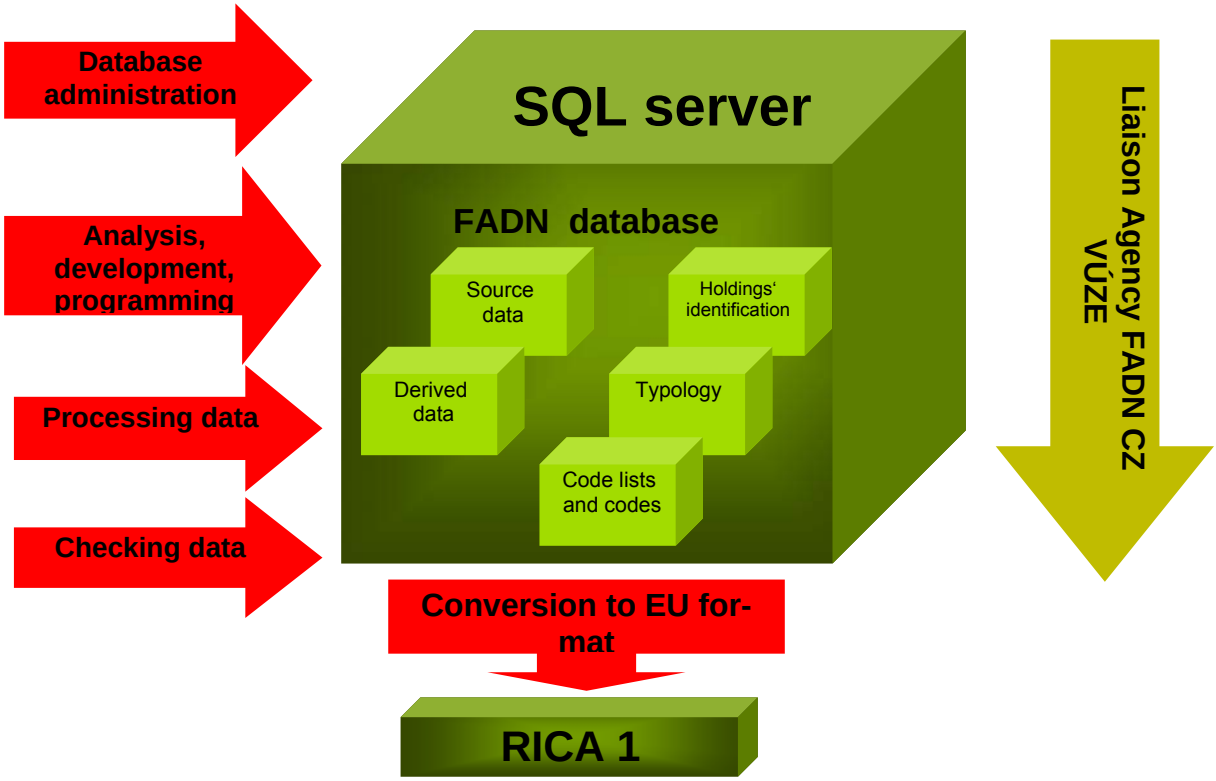
- data analyses on the farm level including local tests and outputs (EU Standard Result and calculation of costs per production unit);
- forwarding of data to the centre.

The Internet connection is still problematic for some clients, especially for data providers. Therefore it is necessary to maintain the local 'www OFF - line' application for collecting of data. This application runs in MS Access.

Scheme 14.2 illustrates the module 1 structure.

14.2.2 Module 2

Central data processing:
- administration of database of returning holdings and data providers;
- import of collected data;
- checking of data;
- processing of farms' typology;
- processing of data'
- secure, protected storing of data'
- conversion of data to the EU format.



Scheme 14.3

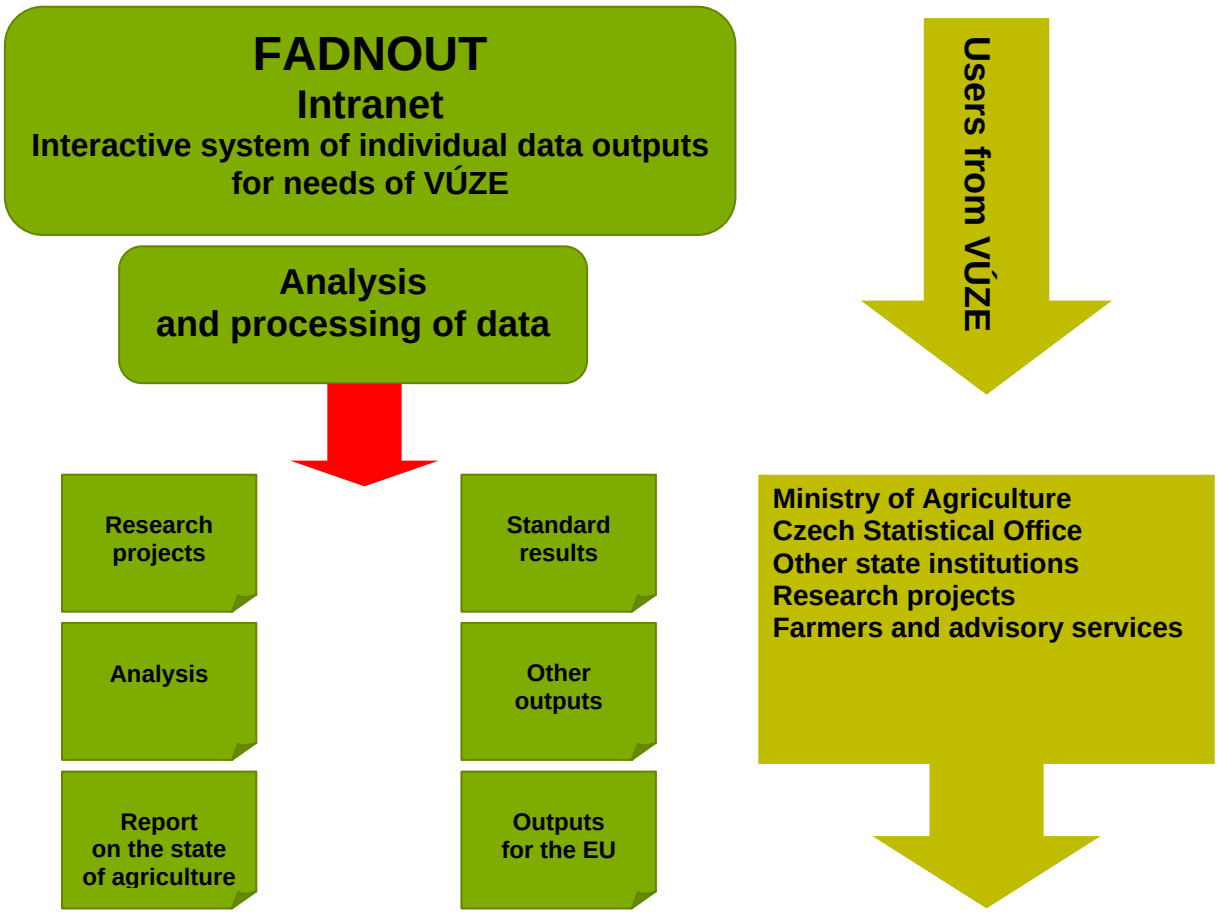
14.2.3 Module 3

This module is an on - line dynamic web application which operates with individual data. It is accessible via the Internet browser. It is intended for workers of the Liaison Agency FADN CZ and for VÚZE workers with appropriate competence; however these workers use only data with limited identification. This application enables an access to the database of primary farms' data from FADN surveys and also data from costs' surveys. The structure of this database corresponds with the FADN survey structure.

It also allows an access to a database of derived farms' data, which are calculated and derived from primary data and they are stored on the farm level.

The important part of this database is data from the EU Standard Result; these allow comparisons with EU data. Another part is a database of costs calculated on the basis of the primary survey data.

The FADNOUT system enables users to create various tables, to select sets of farms on the basis of some limiting factors or simply to make a list of identifying numbers. It is possible to export the selected data via the 'csv' format into MS Excel.



Scheme 14.4

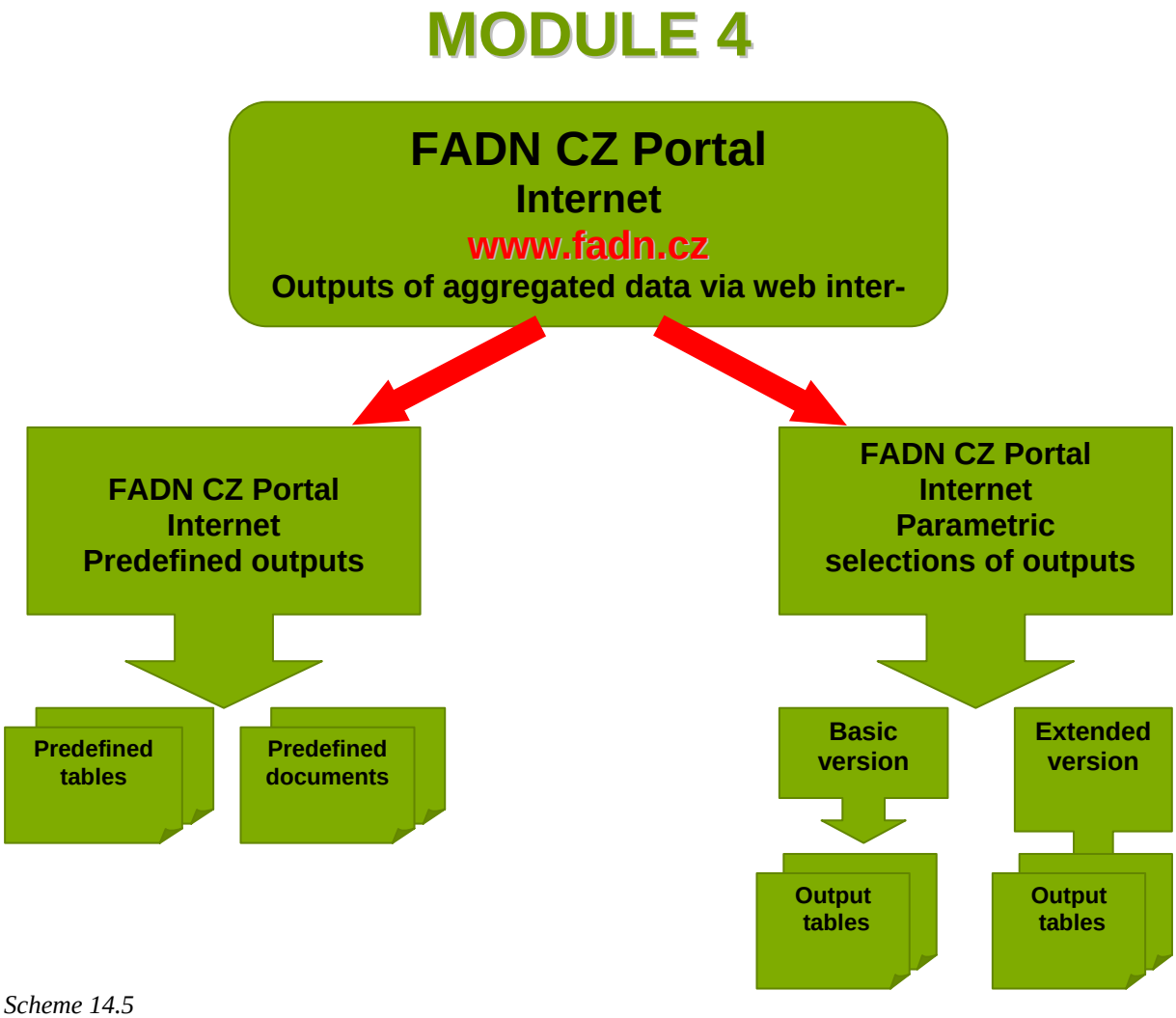
This system is designates mainly for controlling and analytical activities of workers from the Liaison Agency FADN and as a data basis for VÚZE research projects.

Its part is also an aggregating module by which means users prepare aggregated tables from selected set of agricultural holdings according to various criteria (e.g. type of farming, economic size, legal form of holdings, area LFA etc.).

14.2.4 Module 4

The newest part of solution of IS FADN CZ is a portal IS FADN CZ, a project of information system with a database of quantitative economic and production information based on the FADN network with the Internet access for needs of state authorities, advisory services, research institutions and commercial sphere. This Internet application is available for all users with access to Internet.

The architecture of this system is illustrated by scheme 14.5.



Scheme 14.5

The initial data basis of proposed portal contains data from FADN CZ survey and adopted parts of EU database, which allows comparing data of the Czech Republic with the other EU member state. The conception of IS implies with respect to current trends of ICT a multilayered structure of a database with Internet access.

The access possibility - right can be structured for different groups of users too. Generally the database of Portal FADN CZ contents following sections:

- database of primary individual data from particular surveys;
  It contains data from FADN surveys and data from costs' surveys. The structure of this database corresponds with the FADN survey structure and also with requires and needs of decision making sphere;
- database of derived individual data;
  It is a database of derived data calculated on the farm level. It also contains EU Standard Results data and production costs of agricultural products;
- both databases mentioned above are also used in the FADNOUT system;
  Databases of predefined outputs (aggregated tables)
  This database contents aggregated data from FADN arranged into beforehand designed analytic tables according to different criteria. Tables of FADN results from EU information system and comparison of results of EU member states and of the Czech Republic are involved;
- database of documents;
  This database contents archive of methodology documents and publications relating to FADN network. Documents containing a methodology of a survey, deriving and calculation of particular indicators, official publications of FADN results are included.

The information system is a dynamic on - line web application available via Internet browser. This application allows an access to either dynamic or static part of public IS FADN CZ. The dynamic part involves a database of primary data of FADN survey and a database of derived data on a holding level; users by the help of the parametric interactive system create alone or take a share in creating of outputs of aggregated data according to user's permission.

This parametric interactive system of selection allows the different access to data and to functions of application and makes possible to sort data according to the required criteria - limited conditions, these conditions are possible to soever combine by users to obtain required set of data.

This application makes also accessible static part of IS FADN CZ containing database of predefined aggregated tables (Outputs according to the Czech methodology, FADN standard results according to the EU methodology, FADN standard results of the other EU member states etc.) and database of documents (methodologies, official publications etc.).

14.3 Conclusion

IS FADN CZ is an integrated system for collecting, checking, processing and distribution of FADN data. The system is very flexible and it allows quick reacting to requirements of all users.

The used technology is very modern and enables a comfort both for its users and for a system administrator. In the whole system is a high level of a security and it ensures the maximum protection of individual data. The system is opened to the wide professional public through the latest part (FADN Public).

Accessing of this information to the research, advisory, educational and business sphere should contribute to a higher competitiveness of the Czech agriculture in the long - term horizon.

15. Succession plans of farmers in Northern Germany

Dr. Hendrik Tietje[1] and Privatdozent Dr. habil. Hans-Hennig Sundermeier[2]

Abstract

The paper describes the succession planning on farms in Schleswig-Holstein (Northern Germany). 348 farm families have been surveyed by questionnaires by the Department of Food Economics and Consumption Studies, University of Kiel. Main objectives were the investigation and analysis of the farm situation and the personal motivations and attitudes which influence the retirement and succession plans. The results indicate the current mood in the North German agriculture, where the farmers and their successors are predominantly content with their profession as well as with their income and have an optimistic perspective on the sustainability of their farms. Consequently most of the successors plan to invest in spite of the dependency on the CAP.

Keywords: farm succession, retirement, attitude to farmer's profession, investments intentions, Germany.

15.1 Introduction

In spring 2003 a study about succession planning on farms in Schleswig-Holstein started at the Department of Food Economics and Consumption Studies, Christian-Albrechts-University, Kiel. Main objectives were the investigation and analysis of the farm situation and the personal motivations and attitudes which influence the succession and retirement plans. The following excerpts are drawn from the results collected for the dissertation 'Hofnachfolge in Schleswig-Holstein' ('Farm successions in Schleswig-Holstein', Tietje 2004). The 'Landwirtschaftlicher Buchführungsverband' ('Agricultural Bookkeeping Association'), located in Kiel (Northern Germany), supported this survey of 1,198 of its members (minimum age 45 years) about their succession considerations. The response resulted in a data-base of 348 questionnaires which corresponds to a response quota of 29%. Many individual statements were cross-checked by the economic indicators drawn from the bookkeeping results of the farms (in those cases when the farmers allowed the use of their financial data for the accounting periods 1998/99 until 2001/02).

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The interviewed farms had an average agricultural area of 112.7 ha and a share of rented land of 44.6%. Dairy and arable farming dominate as farm types. During the accounting periods 37% of the farms earned profits between 50,000 € and 100,000 € per year; 15% of the farms earned 100,000 € or more. The farm succession decision is settled for more than 50% of the farms (figure 15.1). Only 10% responded that a succession in the family is not likely or will definitely not occur.

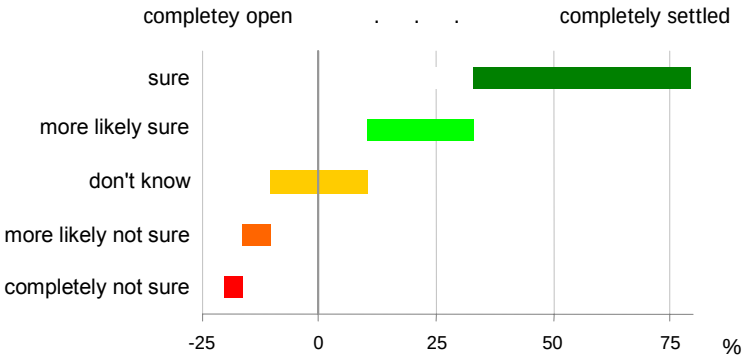

Figure 15.1 Farm Succession Decision is ...

The succession situation in the farms surveyed is significantly more positive (59.8% of the farmers interviewed have already selected their successor) than the earlier results of the agricultural census 1999 (only 36% of the farms had a successor). Above a threshold of approx. 75 ha the farm succession is more often classified as settled or more likely settled.

15.2 Attitude Towards Farmer's Professsion

Figures 15.2 and 15.3 exhibit the attitudes to farming and to the future of the farm with respect to the farm succession. The majority of the surveyed farmers (58.0%) is content with the economic situation in general and with the choice of profession. The family tradition to run a farm plays an important role. Nearly half of the farmers (47.7%) estimates the workload as too high, but a double burden resulting from activities outside agriculture is not felt by the majority of the farmers (58.9% select 'completely not applicable').

The respondents judge the income situation very differently. More than 40% view their income as appropriate, a third (33.9%) shares this statement only partially. The financial situation of the farm is rated dominantly positive. The necessity of investments is also estimated differently; two thirds agree partially or totally that investments are necessary. The majority of the farmers rate their farms as sustainable in the long run. Nearly all respondents judge the predictability of the political conditions negatively. Legal and administrative requirements (e.g. environmental regulations, 'cross compliance') are viewed as obstructive for farming.

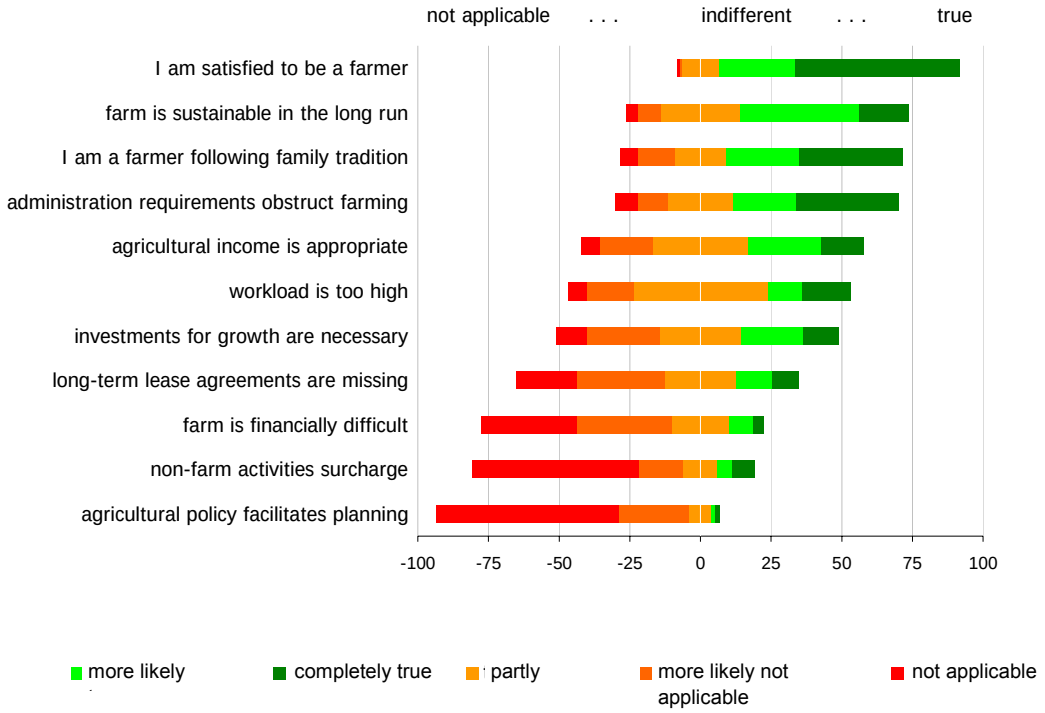

Figure 15.2 Appraisal of Farmer's Profession

15.3 Farm Succession Decision

The relation of the family to the farm and to the farming profession is identified very easily by the response concerning the succession decision (figure 15.3). About 85% of the surveyed farmers plan that the farm should stay with the family. Those who are themselves content with their professional choice try to enable their children the farmer's profession. The majority of the farmers estimates that their children are interested in farming. Interest grows with the agricultural area. We can conclude that the future successors take the economic situation into account. A large majority of farmers (84.8%) considers a successor out of the family as best-suited. The farmers themselves want to reside on the farms (54.9%) and continue to work (59.5%) after retirement. Retirement provision regulations are important for the majority (55.7%).

Arguments which contradict a succession by one of the children are scarcely approved. 38.2% of the farmers share the statement, that farmers cannot find a spouse, whereas 43.7% do not agree that it is difficult for the successor to find a partner. Nearly half of the farmers expects an appropriate sales price for the farm in the case that a successor could not be found. The current owners see no different positions within the family about the succession decision; three quarters of them consider the decision as a consensus decision. In consequence a fifth agrees to the statement that the future farm

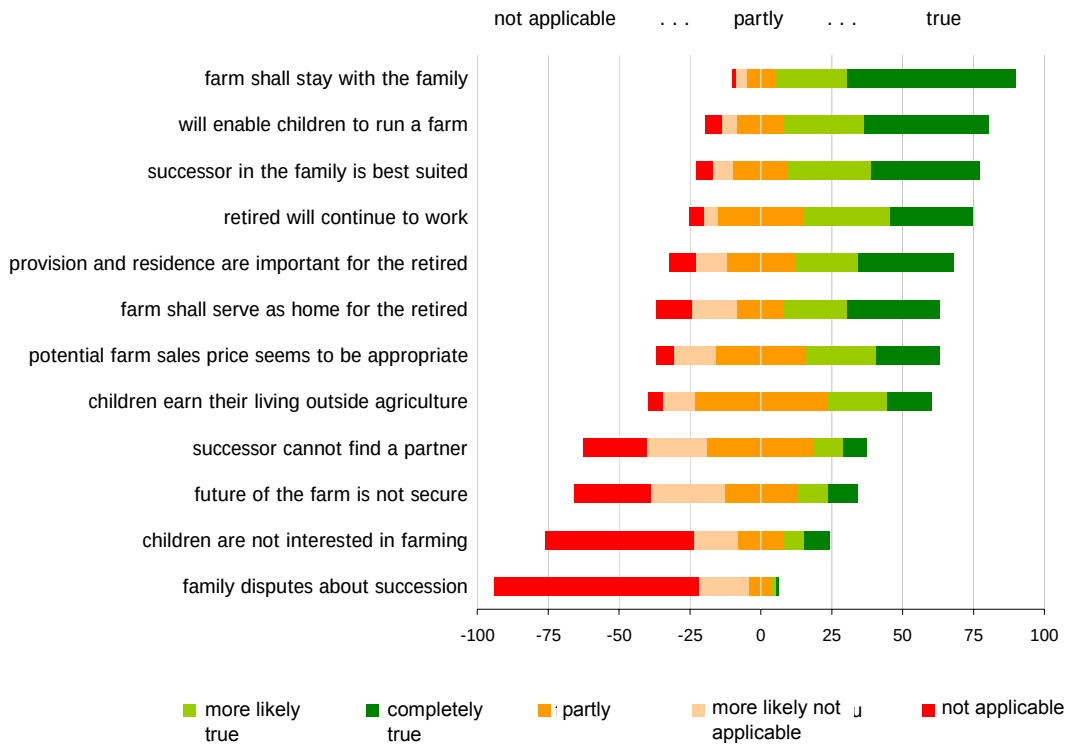

Figure 15.3 Appraisal of Farm Succession Situation

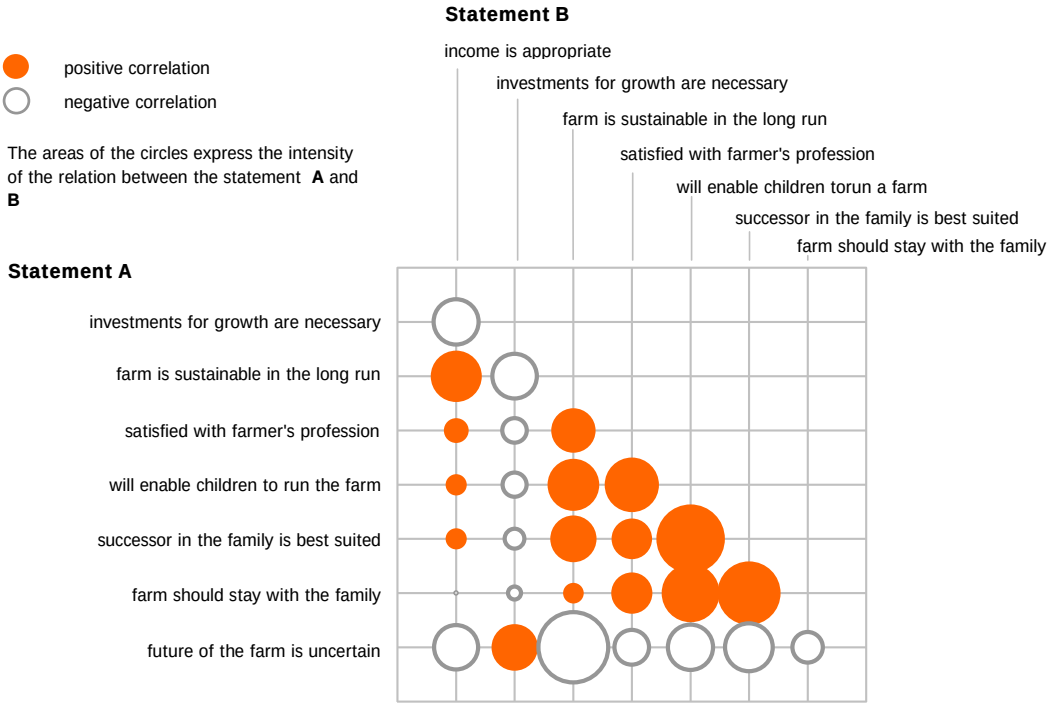

Figure 15.4 Correlations between Single Statements

situation will be safe. Comparing the response of the farmers with a probable successor with those who will presumably exit farming shows that the long-term sustainability of the farm is classified lower by those with unsettled succession decision. In addition farmers with unsecured succession more frequently agree to the statement, that none of their children is interested in farming. Consequently they do not want to enable their children to become a farmer. Following their negative judgement about the long-term sustainability these farmers will advise their children to professions outside agriculture. Despite these differences nearly all farmers would prefer the farm to stay with the family.

Figure 15.4 exhibits some correlations between single statements. The farmers who consider their income as appropriate, view investments for growth as not necessary and evaluate the future of their farm as not unsafe. They share the position that their farm can survive in the long run. If a farm is classified as sustainable, these farmers are content with their profession and try to enable their children to become a farmer. Uncertainty about the future situation of the farm is strongly correlated with a missing long-term survival perspective and dissatisfaction about the earned income. These farmers advise their children against the farming profession and perceive a missing interest of their children in agriculture.

15.4 Succession Implementation Steps

A vast majority of farmers discusses the succession plans in the family; but only half of the respondents names the successor explicitly as discussion partner. The most important external consultant is the tax consultant; his advice is preferred in about 50% of the cases. The preference for the tax consultant does not depend on the succession plans; his advice is desired in both cases - continue farming or exiting agriculture.

The most prevalent aspect to prepare the farm succession is the personal retirement provision. 70.4% of the farmers have contracted private pensions funds. The importance of the farm as the only source of the pension plan decreases. On the same time nearly half of the respondents has written a last will, whereas a fifth (21.8%) has no intention to do so. More than a half has built a house or has furnished a flat or plans to do so. In 33.9% of the cases the succession is settled - at least informally by oral agreements. A formal participation of the successor in the farm enterprise is realised often (19.5%) in form of an employment contract. Founding a partnership is less important (8.3% of the cases). In most cases a formal participation of the successor in farm management is not established until farm lease or transfer (succession). Taking into consideration that nearly a third of the successors is already working exclusively on the parental farm, these values seem to be low. If formal contracts are agreed upon the retirement plan coincides with the settlement of a succession contract.

15.5 Farm Business Changes Accompanying Succession

A substantial share of the farms has planned capacity enlargements and investments in new equipment or plans to do so (figure 15.5). Both changes normally take place before succes-

sion, only few farmers mention investment intentions after completion of succession. The enlargement of the agricultural area and the procurement of new machinery are the most frequent activities which are already completed, whereas the enlargement of the stable capacity and investment of stable machinery are the most frequently planned. Considering completed and planned investments the enlargement of stable capacity is preferred to the enlargement of the agricultural area. One reason is the relatively high share of dairy farms.

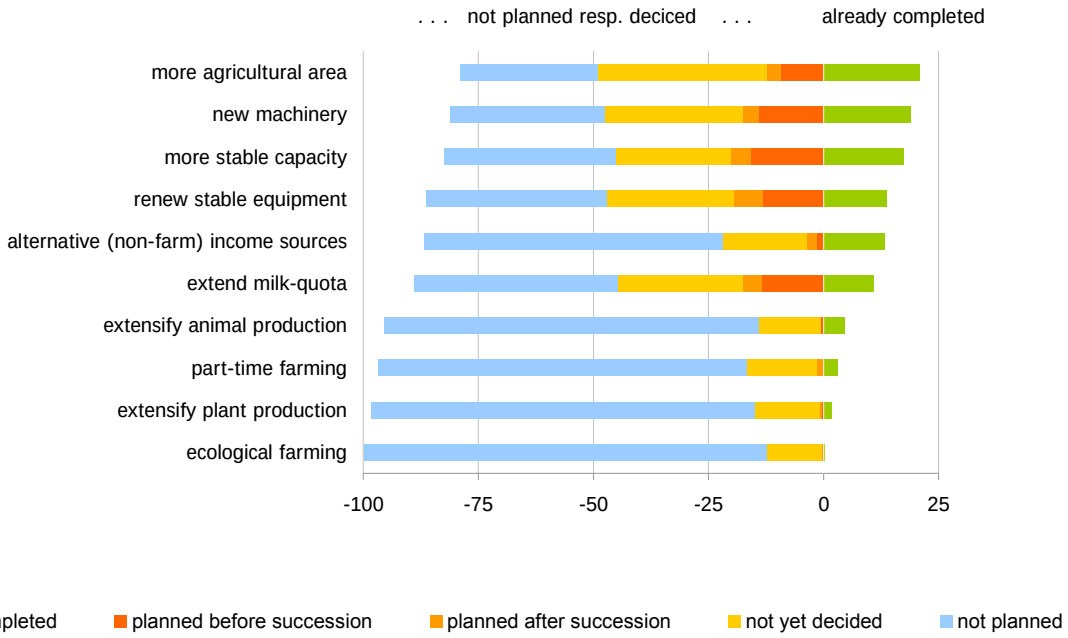

Figure 15.5 Changes of Farm Business Organisation are ...

As expected the farm growth - by enlargement of the agricultural area as well as by stable capacity - is correlated with investments in new machinery. A similar observation can be made on farms extensifying agricultural production. This strategy is often accompanied by a reorientation to part-time farming or the development of new income sources.

15.6 Conclusion

The majority of the respondent farmers shows a positive attitude to the future. Their decision to continue their ancestor's profession comes very deliberate. In many cases, the successors feel themselves capable to manage the farm by their own and to bear the entrepreneurial risk. These farmers are completely content with their profession and have an optimistic perspective for the future. The farm succession is settled most frequently in the way that the farm continues to operate. The plan to continue farming seems to be future-oriented and not very much influenced by backward-oriented tradition motives. According to this investments in farm growth and new machinery accompany farm succession.

Reference

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16. Succession decisions and retirement income of farm households

Ashok K. Mishra[1]

Most farm households control a substantial amount of wealth. In 2001, U.S. farm households had an average net worth of $545,869, compared with $395,500 for nonfarm households. Failure to plan carefully for retirement and transfer of the estate can result in serious problems such as financial insecurity, personal and family dissatisfaction, and unanticipated capital losses. The fact that a large part of farm family wealth tends to be held as illiquid, indivisible assets makes the succession and retirement process particularly difficult, but important for farm families. This is not unique to family farms as the productive assets owned by many self-employed individuals or family businesses have similar characteristics. For family farms, the farm itself constitutes a physical asset that is highly illiquid, indivisible to a large extent, and in most cases constitutes a large fraction of family wealth.

Many studies have shown that even when the farm business cannot provide the family with an adequate standard of living, farmers refrain from selling farm assets and try to supplement their income from other sources, such as off-farm work. Further, the survival of the family farm is highly dependent on successful intergenerational transfer. Entry into farming by the 'next generation' holds a place of central importance in the determination of industry structure and total number of farmers and farm families.

The family farm is more than an income generating enterprise. It is an asset whose productive life expectancy may extend well beyond that of its operator, and whose future value depends crucially on the way it is managed and the degree to which its productive capacity is maintained. It is a place of residence for the farmer in old age, and it is attached to land, whose symbolic importance exceeds its economic value for many landowners, environmentalists, and others. This evidence points to the fact that retirement and succession considerations cannot be disentangled from day-to-day farm management decisions. Synchronizing the growth and decay cycle of the farm business may itself be crucial for the continuance of the farm family business. Clearly, intergenerational succession is one of the important links between these two cycles. This paper provides an understanding of the various farm, operator, household, and financial characteristics that affect an operator's decision to retire and designate a successor to operate the farm. Further, the paper describes the retirement horizon of farm operators and documents sources of retirement income for farm households.

16.1 Sources of Retirement-Succession Plan Data

Data for this analysis are from the 2003 Agricultural Resource Management Survey (ARMS). ARMS is conducted annually by the Economic Research Service and the Na-

[1] USDA Economic Research Service, Washington DC. The views expressed in this paper are those of the author and do not necessarily reflect the views of the United States Department of Agriculture.

tional Agricultural Statistics Service. The survey collects data to measure the financial condition (farm income, expenses, assets, and debts) and operating characteristics of farm businesses, the cost of producing agricultural commodities, and the well-being of farm operator households.

The target population of the survey is operators associated with farm businesses representing agricultural production in the 48 contiguous states. A farm is defined as an establishment that sold or normally would have sold at least $1,000 of agricultural products during the year. Farms can be organized as proprietorships, partnerships, family corporations, nonfamily corporations, or cooperatives. Data are collected from one operator per farm, the senior farm operator. A senior farm operator is the operator who makes most of the day-to-day management decisions. For the purpose of this study, operator households organized as nonfamily corporations or cooperatives and farms run by hired managers were excluded.

The 2003 ARMS collected information on farm households in addition to farm economic data. For example, it collected detailed information on off-farm hours worked by spouses and farm operators, the amount of income received from off-farm work, net cash income from operating another farm/ranch, net cash income from operating another business, and net income from share renting. Furthermore, income received from other sources, such as disability, social security, and unemployment payments, and gross income from interest and dividends was also counted.

In addition, the 2003 ARMS queried farmers on their anticipated retirement from farm work and plans for the future of the farming operation (rent, sell the farm operation, turn the management and operation of the farm over to another partner and/or family member). Farmers were also queried about whether they had developed a succession plan for their farming operation. These questions were developed to support research focused on the livelihood, savings, and investment choices of farm households. The farm itself is a significant, even dominant, component of the household asset portfolio for most farm households. As such, it is a source of earnings and wealth that help support household expenditures at different stages of the life-cycle.

16.2 Respondent Demographics

There are nearly 2.0 million farm families in the U.S that are engaged in farming at some level. Not all of them are actively involved in farming as a primary economic activity of the farm household, since many households dependent on off-farm income choose to reside on farms in rural areas. The average farm operator is about 56 years old and operates an average of 452 acres. The size of operation varies by the commodities produced, location of the farm, and plans for retirement of the farm operator. For example, operators who indicate that they are retired, operate (on average) a 193 acre farm. On the other hand, operators age 65 or older (not retired or retiring anytime soon) have an average of more than 817 acres in their operation. Several things stand out in American agriculture: (1) farms vary extensively in terms of acres operated and commodities produced; (2) farms are located in different regions; and (3) farm households derive income from many sources, including off-farm work.

The 2003 ARMS asked farm operators about labor and employment decisions for farm operators and their spouses. In 2003, 45% of operators and 54% of spouses reported that a job other than farming was their principal occupation. To obtain information about the employment choices made by farmers and/or their spouses, those who reported a principal occupation other than farming were asked a follow-up question focused on whether that occupation was the operator's or his/her spouse's career choice. Three-fourths of operators and four-fifths of spouses responded that their non-farm occupation was their career choice. Most farm operators who worked off the farm were employed by private companies. Private businesses were also the main employer for spouses, followed by government or schools. The heavy emphasis in employment of operators and spouses by private companies or nonfarm business ownership demonstrates the importance of the general economy to the financial status of farm households.

Farm household income originates from both farm and nonfarm sources. While off-farm wages predominate, income from another business - such as a machinery repair shop, seed dealership, or insurance agency - can also add to farm household income. Income from interest and dividends includes the interest income from savings and investment accounts. Dividends earned by households are from investments in equities such as stocks or mutual funds. Additional sources of nonfarm income include pensions, annuities, military retirement, unemployment, Social Security, veterans' benefits, other public retirement and public assistance programs, and rental income from properties. By combining income from farm and off-farm sources, farm operators received an average household income of $66,190 in 2003, higher than the average for all U.S. households ($59,067). On average, 91% of farm operators' household income came from off-farm sources in 2003. Reliance on off-farm income, however, varied widely among different types of farm households. Due to off-farm income, average farm household income was particularly high in metro areas. However, it should be noted that the share of off-farm income varies with region, stage of the farm operators' and their spouses' life-cycle, and work choice of farm households.

16.3 Retirement plans of farm operators

The issue of retirement and succession is especially pertinent for farmers who are ready to retire within the next five years. Their retirement will have implications for farm wealth, industry structure, and the supply of food and fiber. Using the 2003 ARMS, farm operators have been classified into four categories based on their reported retirement information. The first category includes farm operators who indicate that they are already retired (about 4% of farm households). Second are farm operators who indicate that they will retire in the next five years (about 7% of households). Third are farm operators who are age 65 and are not retired nor plan to retire (9% of households). Finally, the largest category (80% of households), consists of all other principal farm operators. Retiring and retired farm households have a significant presence in the farming community (figure 16.1).

Information is reported on responses to five major questions concerning these retirement categories: (1) which farmers plan to retire as reflected by age, experience, work

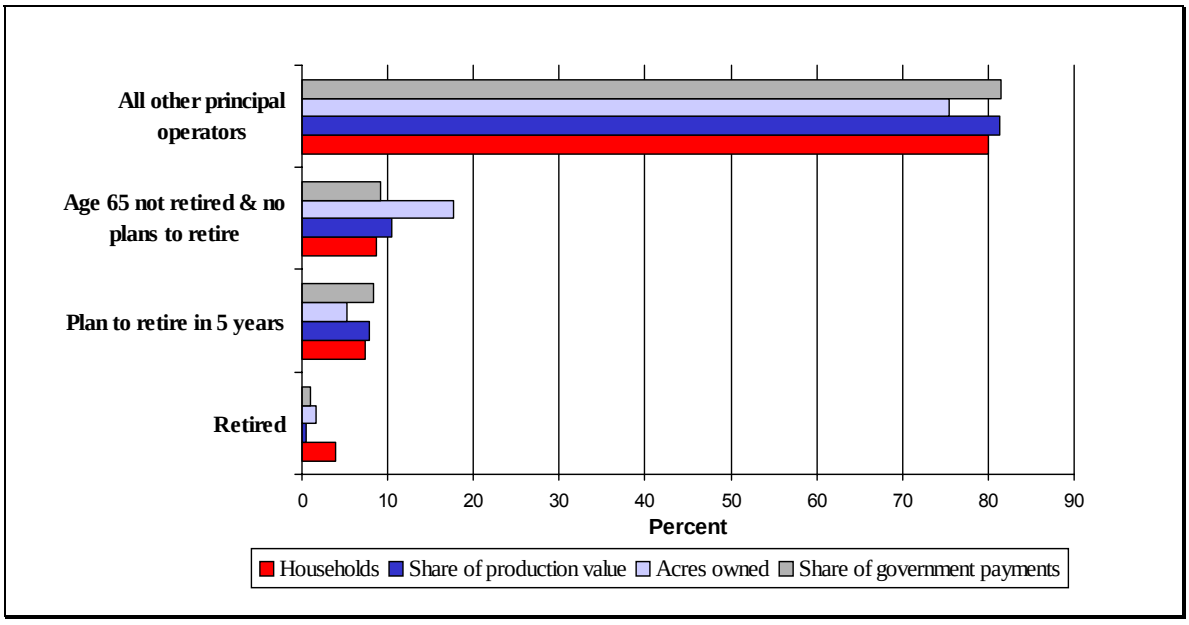

Figure 16.1 Retiring and retired farm households have significant presence in the farming community
Source: 2003 ARMS/USDA.

time, income levels and sources, and household net worth; (2) where they are located geographically; (3) what commodities they produce; (4) how much land they own and control; and (5) what they plan to do with the farm upon retirement.

Which Operators Plan to Retire? Over 7% of principal or primary operators of farm businesses are planning to retire from farm work within the next five years. Of those operators planning to retire from farming the average age is 55, with 60% in the age 55 to 64 group. Operators who report that they are retired average 70 years of age and 76% are age 65 or older. Farmers who are either retired or are planning retirement tend to have more than twenty years of farming experience. On average, retired operators have farmed for over 19 years, while those who are contemplating retirement have farmed 21 years. Nationally, the average for all farmers is 23 years. The primary occupation of operators who are planning to retire from farm work is divided between farming and off-farm work as it is for operators of farms from all households. For operators who are planning retirement, 56% report a nonfarm primary occupation.

Where are Farmers Who Plan Retirement Located Geographically? While farmers who indicate retirement or planned retirement from farm or ranch work are located throughout the country, some regions have a larger than proportionate share of operators at this point in the household and business life cycle. The Eastern Uplands and Fruitful Rim account for over two-fifths of all retired operators and a fourth of operators in total. The Heartland, Eastern Uplands, Northern Crescent, and Fruitful Rim have nearly 68% of all operators who report planned retirements. Among regions, about two of five planning to retire operators are located in the Heartland (21.2%) and Northern Crescent (19.1%), the largest shares among the regions (figure 16.2).

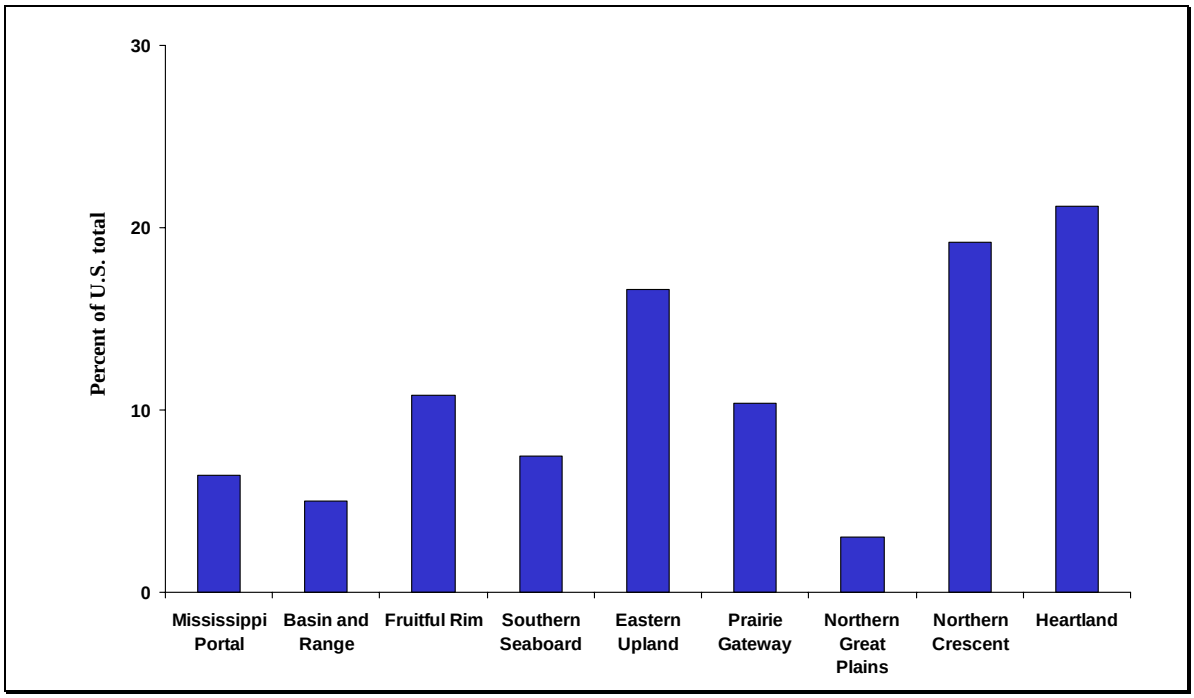

Figure 16.2 Retiring farm households are located across all regions of the US
Source: 2003 ARMS/USDA.

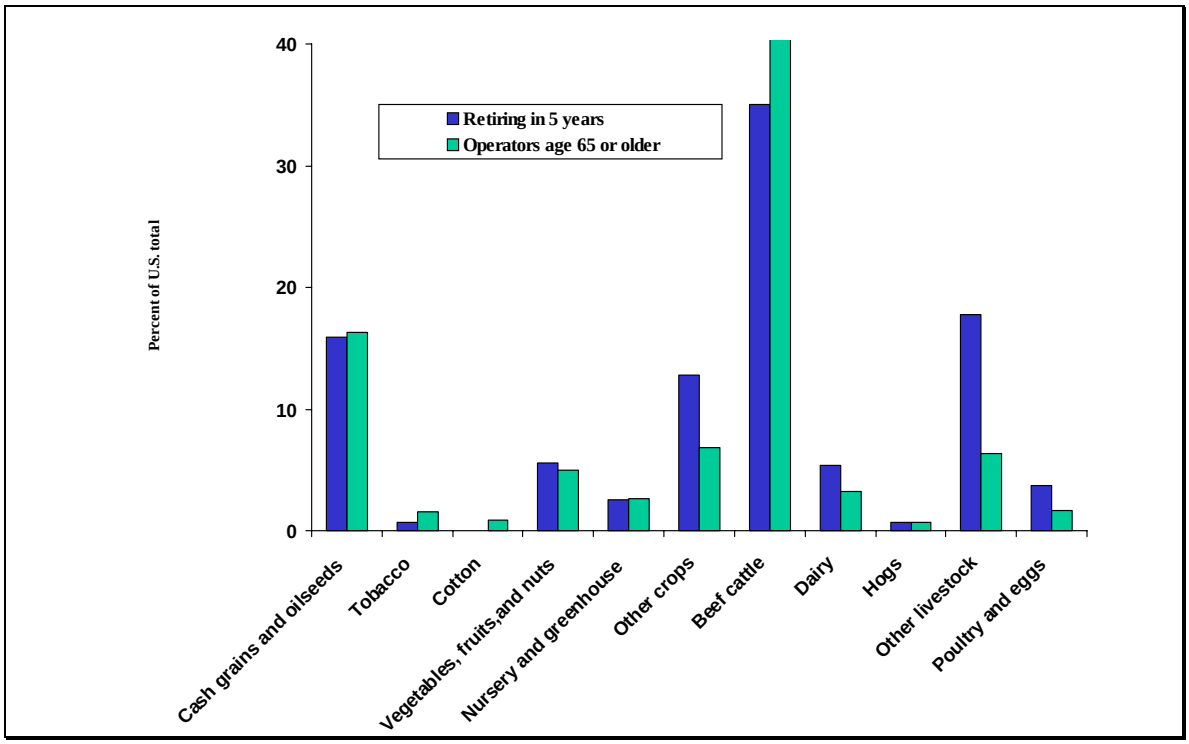

Figure 16.3 Retiring farm households are predomininantly livestock enterprises
Source: 2003 ARMS/USDA.

What Commodities Do They Produce? Operators who plan to retire, on average, produced $82,267 of agricultural output in 2003, compared with $76,788 for all U.S. farmers. Their farms accounted for over 7% of the value of agricultural production. Given their disproportionate location in the Heartland, Eastern Uplands, Fruitful Rim, and other grain and oilseed production areas, it is not surprising that farmers planning retirement accounted for over a third of beef cattle farms and nearly 18% of other livestock farms. On the other hand, among operators age 65 or older, more than 55% specialize in beef cattle, and one-sixth in cash grains and oilseeds (figure 16.3).

How Much Land Do They Own and Operate? Households with operators who report retirement plans own 356 acres, on average, compared to 452 owned acres for all households or about 6% of total land owned by operator households. In total, land owned by operators who report retirement plans amounts to about 87 million acres. Further, about 40% of households with operators who report retirement plans participate in government farm programs, receiving an average payment of $5,657, slightly higher than the average for all farm households ($5,019) (figure 16.4).

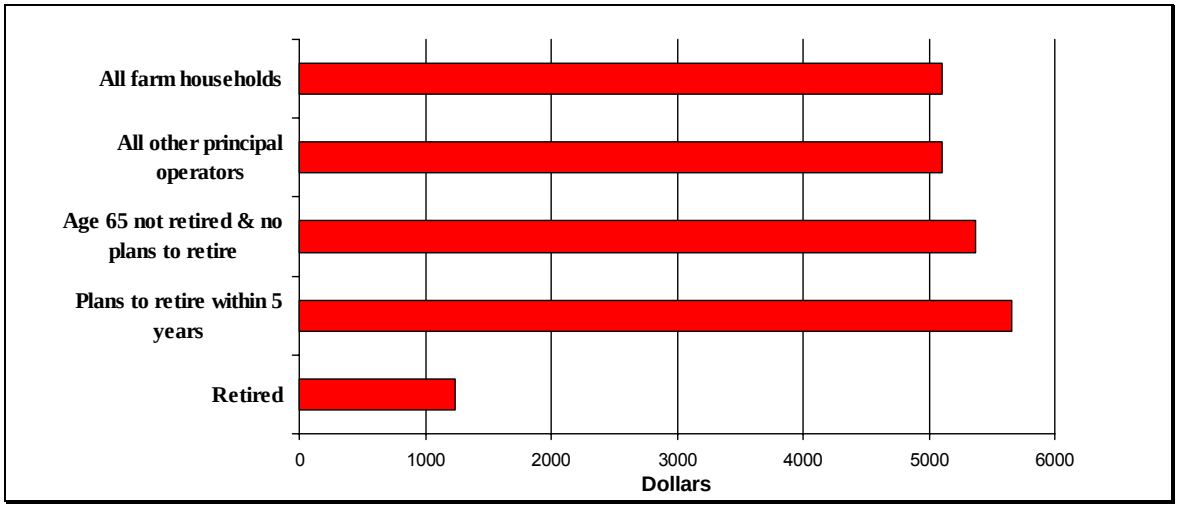

Figure 16.4 Retiring farm households receive significant government farm program payments
Source: 200 ARMS/USDA.

In contemplating retirement from farming, households must consider the future of the farm. Tax laws may encourage older farmers to hold onto their land and rent it out for retirement income. Despite reduced tax rates on capital gains associated with the appreciation in farmland values, the prospect of avoiding capital gains taxes on any appreciation prior to death by transferring the land at death continues to encourage farmland owners retain ownership of their land. Recent changes in Federal estate tax policies that allow larger amounts of property to be transferred at death free of any estate tax further reinforce this incentive. Among operators who plan to retire from farming in the next five years, approximately 1 out of 5 indicate that they plan to rent out the farm (22%), and another one-fifth plan to sell the farm (20%). The remaining operators plan to turn over operations to others or convert their land to other uses.

16.4 Succession decisions of farm households

Succession planning is a component of a household's risk management strategy for its farm business in as much as it is aimed at continuity of the business management team. Data on the interrelationship between a household's retirement and succession plans also provides additional information about how farms will be managed as they pass from the current generation of households. Four factors have a large effect on the succession/transfer of farm businesses. The most important is the owner's age (farm operator's age) followed by farm size, net worth, and the successor's ability to farm successfully. Nationally, a relatively small percentage, 27%, of farm operators indicated that they had a succession plan (figure 16.5). Of those, 87% reported that they had identified a successor, and in most cases the successor was a family member. When asked if the successor worked or participated in the farm business, 52% indicated that the successor participated in the farm business. Further, 38% of designated successors were participating in management activities and decisions for the farm (figure 16.6). About 34% of farm operators who indicated that they will retire in the next five years had a succession plan and about 80% of these households have a family member taking over the farm.

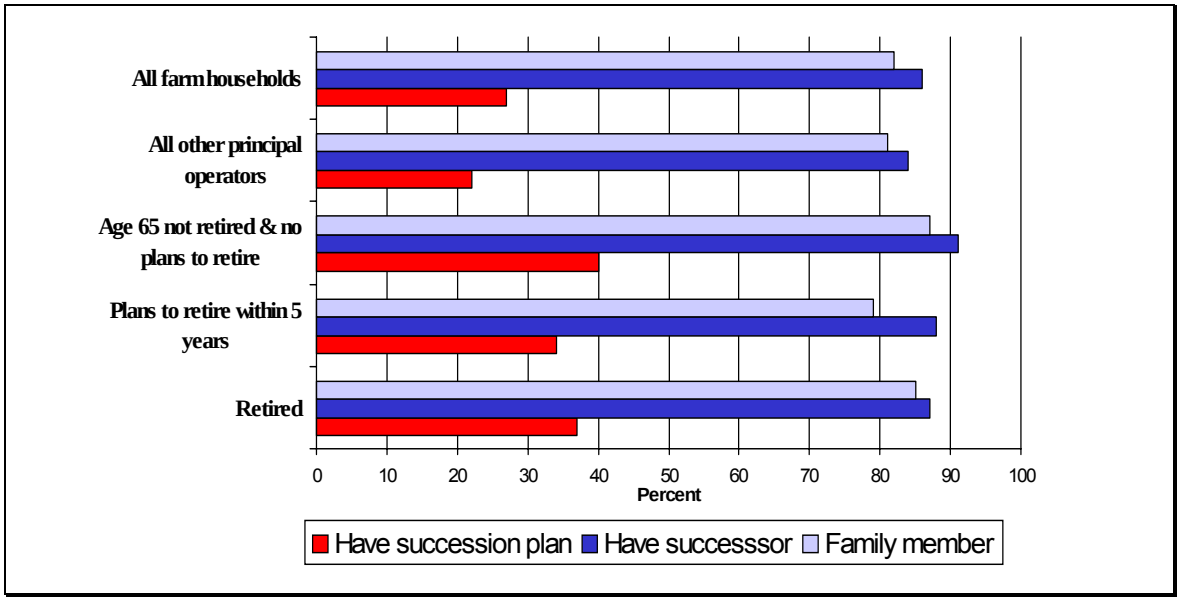

Figure 16.5 Less than one-third of farm operators have a succession plan, retiring farm households have slightly higher

Source: 2001 ARMS/USDA.

Succession planning becomes of greater importance to households when wealth is considered. Wealth, as reflected by net worth, can become an estate tax liability and planning can help ease the transfer of farms from one generation to another or to another party interested in entering farming. Maximization of wealth is assumed to be an individual and

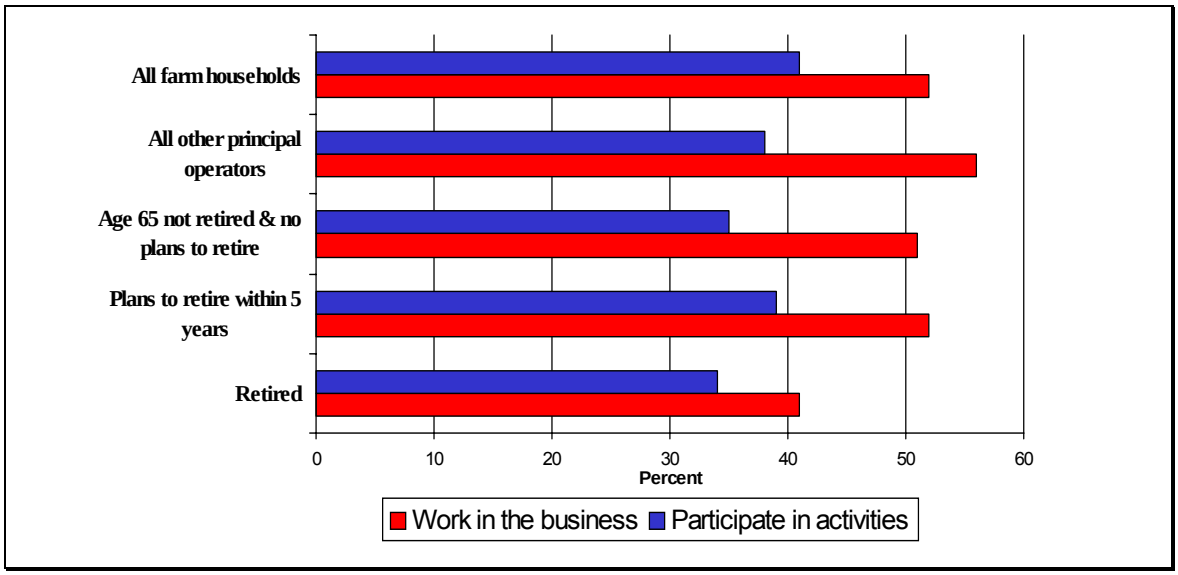

Figure 16.6 Share of successors working in the business and handling management ersponsibilities varies
Source: 2001 ARMS/USDA.

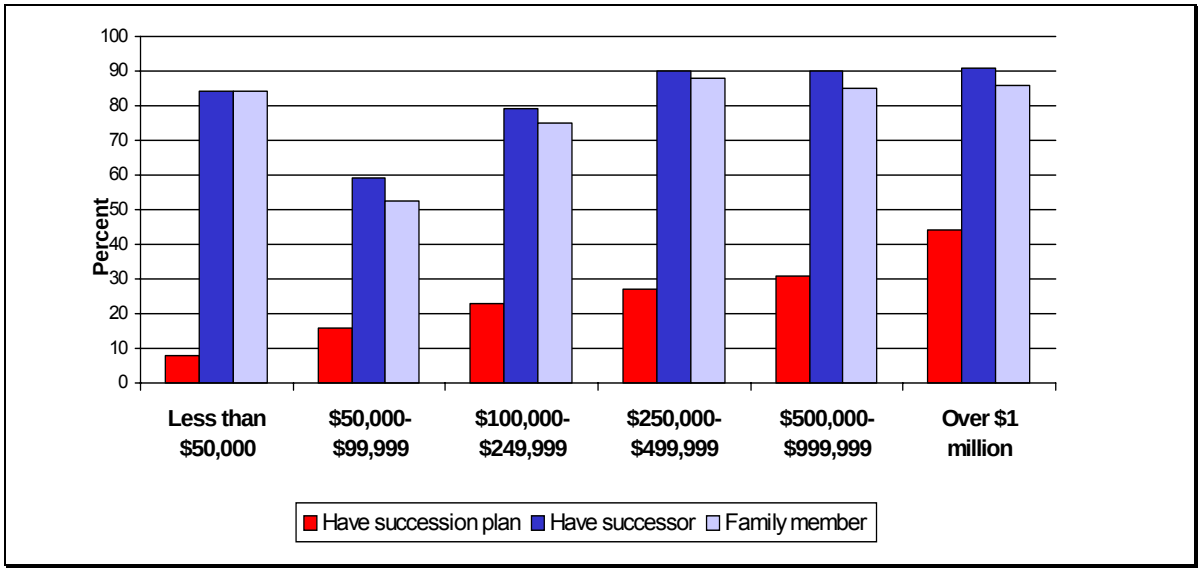

Figure 16.7 Succession planning and successors of farm households by net worth
Source: 2001 ARMS/USDA.

family objective and bequest motives are well rooted in economic and financial theories. The amount of wealth at stake in agriculture is relatively large, compared with most households. Examining succession planning by different levels of net worth reveals a picture that is consistent with theory. For example, only 16% of farm households with net worth between $50,000-$99,999 had succession plans, compared to 31% of farm households with net worth between $500,000-$999,999, and 44% of farm households with net

worth over $1,000,000. Further, among net worth categories with a succession plan, a successor has often been designated and that person is most likely to be a family member small (figure 16.7). However, participation in business, management activities, and other decisions on the farm indicate that the involvement of the successor on the whole is relatively.

16.5 Retirement Income of Farm Households

Any discussion of income, wealth, and retirement warrants a life cycle perspective. Figure 16.8 shows that the composition of farm household income varies by retirement age. Households headed by operators planning to retire from farming have the highest income ($85,888) among all farm households. Nearly 76% of these households reported working off the farm and earning about 49% of their income from off-farm employment in the form of wages and salaries. Farm operator households headed by operators age 65 or older receive a significant amount ($15,635), or about 27%, of household income from disability, Social Security, and other income sources (such as military and Veteran's benefits, other public retirement and public assistance). However, all U.S. households headed by persons age 65 or older, received (on average) nearly 62% of their total income ($30,437 in 2003) from Social Security, private and government retirement benefits.

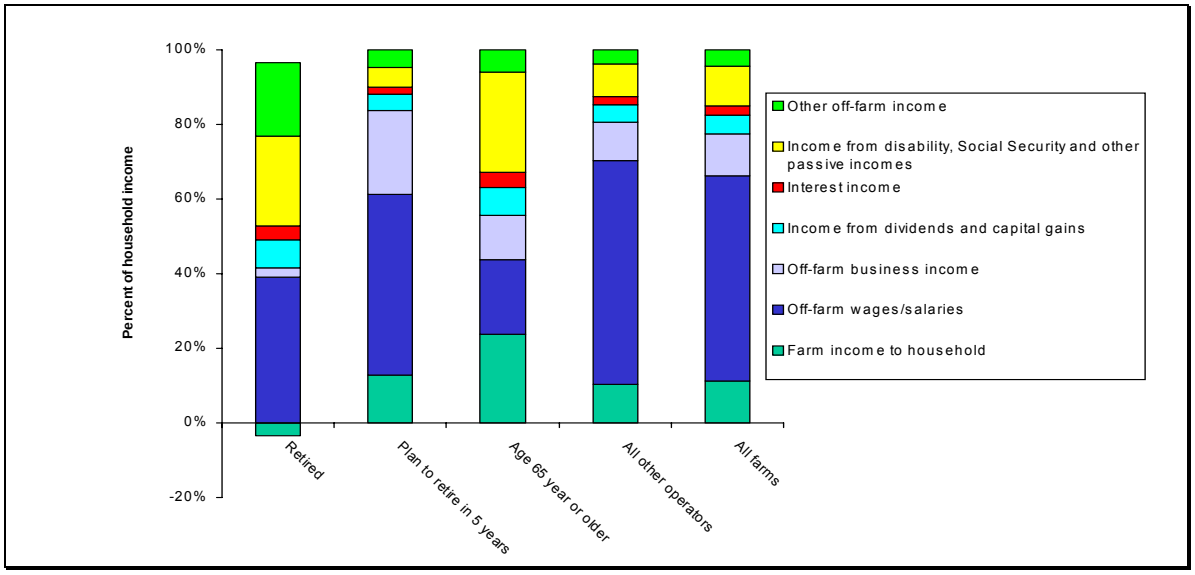

Figure 16.8 Retiring farm households receive majority of their income from off-farm sources
Source: 2003 ARMS/USDA.

An important part of retirement planning is determining how much retirement income is needed to maintain household expenditures. Even though the living standards of farm families have become comparable to nonfarm families, expenditures of farm households differ from nonfarm households. The average expenditure ($37,075) of farm

households in 2003 was slightly lower than nonfarm households ($40,817). Generally, nonfarm households spend a higher proportion of their income on rent/mortgage. However, among households of operators age 65 or older and those planning to retire, 20 to 23% of the income is spent on food and rent/mortgage. Further, these households spent 13 and 16% of their income on medical and health related items, respectively. On average 13% of all U.S. farm households are living in poverty (as established by Office of Management and Budget and consists of money income levels that vary by family size and composition, and age of the operator). However, the percentage of farm households living in poverty is highest among those headed by operators age 65 or older (about 18%). Nearly 10% of households, whose operator indicated planned retirement from farming in the next five years, are living in poverty.

Household wealth may be acquired through savings, inheritance, or appreciation of household assets. Farm household net worth is measured by the value of combined farm and nonfarm assets (minus debt). Farm household assets are dominated by farm real estate (77%), while other physical assets (e.g., off-farm business investments, nonfarm real estate, off-farm houses, recreational vehicles) represent the biggest share of nonfarm assets (33%). However, the share of farm assets in a household's net worth depends on the age and work status of the farm operator. For example, the average net worth from farm assets of retired farm households were only 50% ($474,332) compared to nearly 75% ($757,912) for nonretired operators age 65 or older. Households of retired farm operators have a balanced farm and nonfarm wealth portfolio. The average net worth of farm operators planning to retire in the next five years is smaller ($714,657) than those of retired operators and operators 65 years or older, but slightly higher than that of all farm households. In some sense farm operators planning to retire in the next five years represent the average farm household (figure 16.9).

More than 50% of farm households target current income not used for consumption toward savings and other investment opportunities both on and off the farm. Additionally, 57% of farm families reported in 2003 that they are saving for long-term goals such as retirement, education, or investment in financial markets. Sixty percent of farm households whose operators are planning to retire in the next five years save regularly. This is not surprising since off-farm employment provides them with opportunities to save for retirement or own company stocks. Further, over 75% of these households save for long-term goals. On the other hand, only 38% of household headed by operators age 65 or older save regularly and nearly 46% save for long-term goals (figure 16.10). Savings can be used to finance unexpected future needs, such as financial shortfall in the farm business, or major health care expenditures.

Farm households, like their nonfarm counterparts, have diverse financial portfolios. These include:

- retirement accounts (such as IRA, Keogh Plan, 401(k), and others, excluding Social Security);
- stocks, bonds, and mutual funds;
- cash and other liquid accounts like checking and savings; and
- real estate and other assets not part of the farm business.

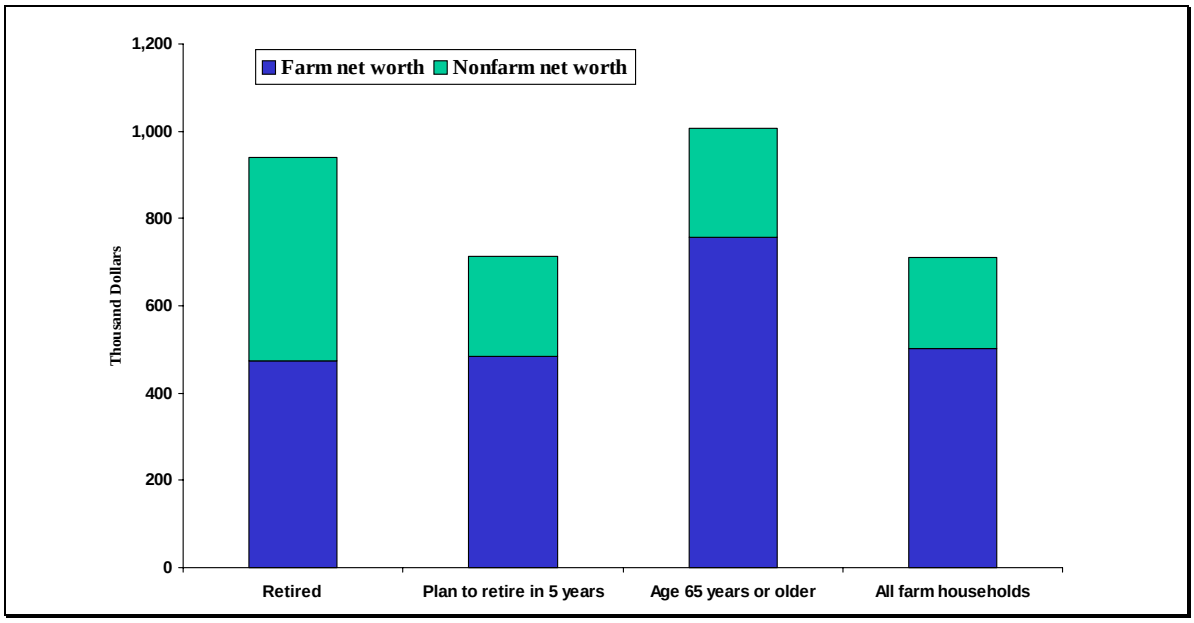

Figure 16.9 Retired and retiring farm households have significant nonfarm wealth
Source: 2003 ARMS/USDA.

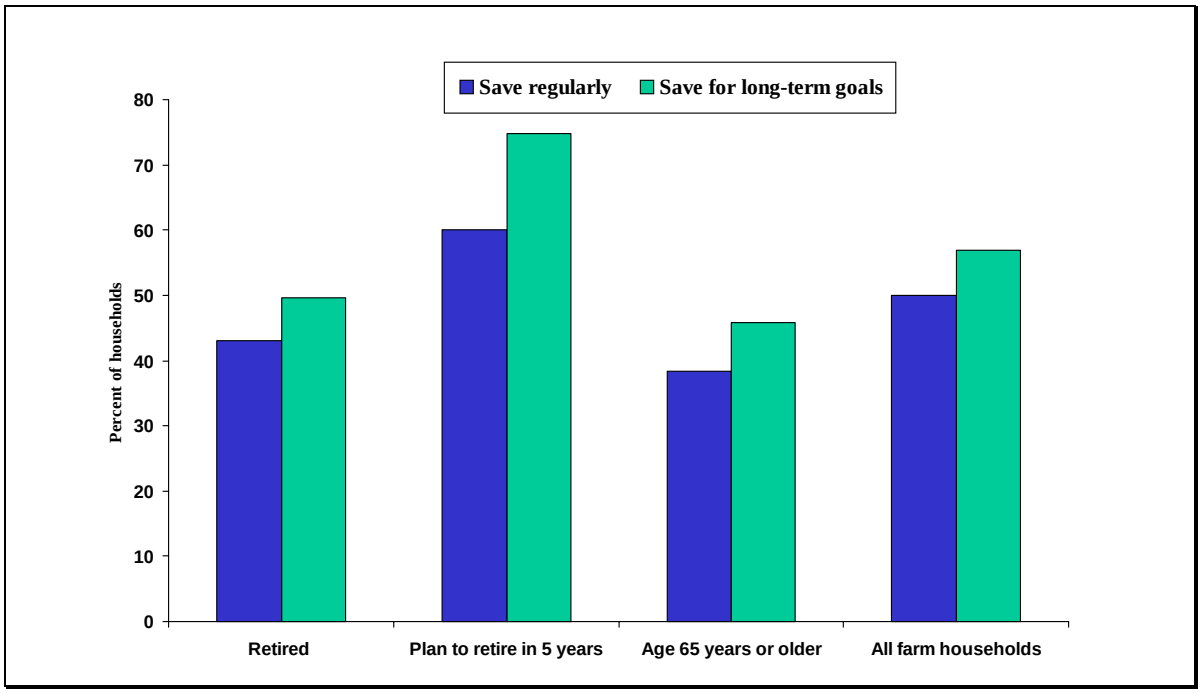

Figure 16.10 Farm households and particularly retiring farm households save regularly or for long-term goals

Farm households of operators indicating retirement in the next five years have 25% of their nonfarm assets held in the form of other nonfarm assets-real estate and businesses

aside from the farm, off-farm houses, recreational vehicles, and other assets. Over one-sixth of nonfarm assets were distributed in retirement accounts, operators dwelling, and liquid accounts. Households of operators age 65 or older had similar nonfarm asset portfolios, however, the share in retirement accounts was lower and the share of liquid assets was about 26% (figure 16.11). Farm households of retired farm operators have 30% of their nonfarm assets in corporate stocks and mutual funds and have 18% of nonfarm assets in retirement accounts.

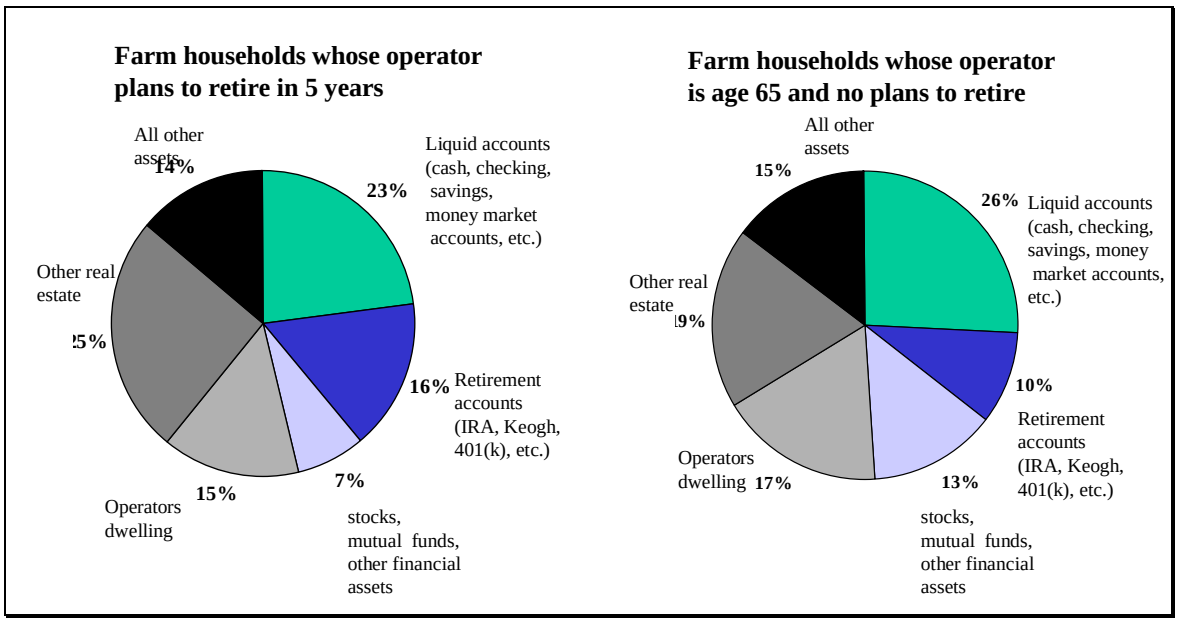

Figure 16.11 Retiring and older farm households have diverse financial portfolios
Source: 1999 ARMS/USDA for farm households and 2001 Survey of Consumer Finances for all U.S. households.

Summary

Nationally, a relatively small percentage, 27%, of farm operators indicated that they had a succession plan. Of those, 87% reported that they had identified a successor, and in most cases the successor was a family member. When asked if the successor worked or participated in the farm business, 52% indicated that the successor participated in the farm business. Further, 38% of designated successors were already participating in management activities and decisions for the farm. Retiring and retired farm households have a significant presence in the farming community. Farm households of retiring farm operators are mainly employed off the farm (nearly 75%), and about 15% of these farm households own off-farm businesses. Further, farming enterprises reported by these households indicate a tendency to specialize in beef cattle, a less labor-intensive enterprise. Farm households of retiring farm operators are less likely to be living in poverty. Households that indicate plans to retire are located principally in the Heartland, Northern Crescent, Eastern Uplands,

and Fruitful Rim region with 70% of all households indicating plans to retire being located in these four regions.

Farm households of operators age 65 or older are mainly employed on the farm and about 18% of these households are living in poverty. Farms of these households are large (an average of 817 operated acres) and also tend to specialize in beef cattle (54%) and cash grains and oilseeds (16%). Farm households of operator age 65 or older are distributed all across the U.S.

Households headed by operators planning to retire from farming have the highest income among all farm households with the majority of their total household income coming from off-farm employment. Farm operator households headed by operators age 65 or older receive a significant amount of household income from disability, Social Security, and other income sources. Income from farming comprises about 24% of their household income. Both categories of households have wealth that is above the average all U.S. households. Farm wealth is a significant proportion of total household wealth. Further, households headed by operators planning to retire have 32% of their wealth in nonfarm assets, whereas households headed by operators age 65 or older have a smaller share (about 25%) invested in nonfarm assets.

Sixty percent of farm households whose operators are planning to retire in the next five years save regularly and over 75% of these households save for long-term goals. About 46% of these households have retirement investments in the form of IRAs. On the other hand, only 38% of households headed by operators age 65 or older save regularly and nearly 46% save for long-term goals. Additionally, only 25% of these households have retirement investments in the form of IRAs. In general, households of operators with plans to retire within five years and households of operator age 65 or older (not retired and have no plans to retire) have a combination of current income and wealth in the form of financial and farm assets sufficient to meet their projected consumption needs in retirement.

Workgroup Session 1
Identifying best practices from Scandanavia on rural businesses

Theme

In this session, and in the opening session by mr. Leif Forsell, we learn from three Scandanavian countries how they deal in their agriculture and FADN with rural businesses, non-farm income and related topics.

During the presentations you are asked to take notes on the form provided on next page. After the presentations you are asked in working groups to compare your notes and make a list of best practices and things that would be problematic in your country. After making this list, try to find solutions for the problems you have written down.

Group composition

Group A

Chair:	Anne Kinsella
Reporter:	Tomas Westling
Members:	Michaela Lekesova
	Torbjørn Haukås
	Kjell Staven

Group B

Chair:	Hans Vrolijk
Reporter:	Martina Harvilikova
Members:	An Van den Bossche
	Maija Puurunen
	Ane Lyng

Group C

Chair:	Eva Øvren
Reporter:	Frank Offermann
Members:	Beat Meier
	Verna Mitura
	Mitko Kostov

Group D

Chair:	Hans-Hennig Sundermeier
Reporter:	Finn Andersen
Members:	Vesna Ilievska
	Catherine Moreddu
	Øyvind Hansen

Best practises 

Problematic issues 

Group A

Best practices	*Related problematic issues*	*Related solutions*
Combination and harmonization of data sources (definitions)	Small farms underrepresented in the samples - ESU	↑ sample to represent smaller size categories
Categorise presentation of results, e.g. part-time/full-time	Definitions - part-time → % income → hours worked, etc.	Harmonise definitions???
Access to different databases within country → steer future research	Access? Co-operation between agencies	More communication/creating network

Group B

Best practises
To get data on all activities
Policy makers would like to have this data
To use different sources, different surface and also different sampling frames
Comparing agriculture with other industries
To get an idea of the structure of the complementary activities

Problematic issues (unrelated to best practises)
What is the population of interest; farming or the whole rural economy?
What is a household?
Different sources, definitions
Lack of small farms
FADN based on CAP-changes in CAP change the requirements on data
Farmers might not be willing to provide this type of data
'Black economy'

Group C

Best practises
Cash-based surveys - simpler - larger surveys possible - non-commercial farms
Detailed, specific surveys
Merge surveys
Bookkeeping obligatory

Problematic issues (unrelated to best practises)
Use for taxation? - Bias - Non-response - Incorporated farms
Population definitions - response-burden - budget-burden Solution: reduce existing surveys
Legislate restrictions

Group D

Best practises
Norway has a good classification of non-farm activity

Problematic issues (unrelated to best practises)
What do we want: a farm survey or a wider survey for the rural region?
What are farm-based factors and what are rural-based factors?
Small units are not included in FADN
Cost classification - the allocation of the costs to the activity
A general problem: the difference between tax data and accounting data (problems to combine tax statistics and accounting statistics)

Workgroup Session 2
Improving FADNs with respect to organic farming

Theme

Many countries try to promote organic farming, and hope organic production will reach e.g. 5 to 10% of production. It is important that organic farming is better represented in the FADNs. These arguments are heard already for a long time, and although the situation is improving, several countries have problems to have a good representation of organic farms.

In this session we would therefore like to focus on the barriers that seems to exist in gathering data on the organic sector in FADNs. For this we use the method of the coloured caps by De Bono.

The caps of De Bono

Discussing topics that are controversial leads often to yes/no disputes which are not very usefull. The Maltese/English thinker Edward de Bono, who studied the process of discussion, thinking and decision making in great detail, therefore invented a method (among many others in what he called 'Lateral thinking') to make such discussions more constructive.

In his book *I am right, you are wrong* De Bono replaced Western style thinking by his theory of 6 caps. In this technique all persons in the discussion involved - symbolically - put a cap of the same colour on their head. A red cap stands for emotion and intuition. A white one for information, information that lacks and types of information. A blue one (at least to put on your head at the start and in the end) stands for the management of the thinking process, the order of the other caps, summary and conclusions. The black cap represents disadvantages, why solutions don't work, risks. The yellow one for advantages, why it works, positive things. And the green one stand for possibilities, new ideas, creative thinking.

By this technique competition between discussing persons and hidden or troubled emotions have a less negative impact on the discussion and its results. It takes politics and ego-ism from western thinking.

In this working group session we give this technique a try out.

Figure 1 Six Thinking Hats (overview)

Figure 2 Six Thinking Hats (overview)

Group composition

For all four discussion groups we have challenging propositions to test the thinking method of De Bono and to find the barriers to improve data gathering on organic farming.

Group A *'FADNs should be obliged to have 5% organic farms in their sample'*

Chair: Catherine Moreddu
Reporter: Michaela Lekesova
Members: Anne Kinsella
Ane Lyng
Øyvind Hansen

Group B *'If the EU does not improve its weighting system on organic farms, the member states should set up a parallel data exchange system with the Eisfom project'*

Chair: An Van den Bossche
Reporter: Martina Harvilikova
Members: Eva Øvren
Hans-Hennig Sundermeier
Frank Offermann

Group C *'Comparison between organic and conventional farms is conceptually so difficult that it should not be done in tables on websites'*

Chair: Hans Vrolijk
Reporter: Tomas Westling
Members: Verna Mitura
Mitko Kostov
Finn Andersen

Group D *'Calculating special SGMs for organic products is not needed'*

Chair: Beat Meier
Reporter: Vesna Ilievska
Members: Kjell Staven
Maija Puurunen
Torbjørn Haukås

Group A

'FADNs should be obliged to have 5% organic farms in their sample'

- Why a limit?
- Why 5% limit in every country?
  - Answer: maybe scope for imposing limit in order to do a special study, but why 5%?
    - minimum- limit should be statistically based on farming population within country.
  - Preference: for specific study of organic farms that can be compared to FADN farms but not necessarily part of it.
- Why do we need the information on organic farms?
  → Viability
  → Environmental impact, etc.
  Already have input use, farm type, size, etc.
  - Question: Are further variables needed for collection?
    - In what sense are they organic?
    - What is definition of organic? (broad or narrow)
  - Question: Why they turned organic?
    - Need more information on marketing channels and consumer demands.
- What are the controls?
  - Harmonization of labels at EU level?
- What can we do to improve things?
  - Reduce min. size category in FADN so as to include organic
  - Do ad-hoc studies
  - Give money to organic farmers to participate
  - FADN provide 'bonus' type payment for submission of organic form return!

Group B

'If the EU does not improve its weighting system on organic farms, the member states should set up a parallel data exchange system with the Eisfom project'

- Need of more information on organic farms and establishment of a new system
  - Dangers
    - Nothing will be comparable
    - Higher costs
    - Two 'thinking islands'
  - Benefits
    - Organic farming would be better represented
    - Customers would be well informed
    - Independency, flexibility
    - Freedom to implement changes
  - Possibilities
    - Cross compliance → conventional farming towards the organic farming

Conclusion

We decided to survey an independent segment under the condition that it will be integrated later.

Group C

'Comparison between organic and conventional farms is conceptually so difficult that it should not be done in tables on websites'

Red hat
- Difficult
- Possible

Black hat
- Different production systems
- Different farmers
- Political pricing
- Small number of observations
- Redefinition of the population

Yellow hat
- Use clear definitions
- Possible to compare other groups
- Use will improve data
- Promote attention for organic farming
- Benchmark for organic farms
- Justify subsidies

White hat
- Do we have enough data?
- Variation among organic farms?
- How/where to present results?

Green hat
- Explain background info and difficulties on comparison
- Define comparable groups
- Publish standard errors
- Correct for structural differences
- Constraints on what to publish

Blue hat
- LET'S DO IT!

Group D

'Calculating special SGMs for organic products is not needed'
- SGM → organic/non organic?
    - Is it realistic to add organic/non-organic to the whole already very complicated SGM-system?

    - One has to be very optimistic to believe that
- Homogenity/heterogenity of farm types or size classes?
- Replace the whole SGM-system.

Workgroup Session 3
Farm typologies revisited: recommendations for future FADN typologies

Theme

In this session we learn about the role of typologies in analysing rural incomes. With the developments in agriculture and agricultural policies, and the possibilities of ICT, there are a lot of arguments not to stick with the current typology in the FADN only. Users are interested in more than only production activities. And SGMs are perhaps hard to calculate in a situation of direct income payments.

In this workgroup session we try to dream of totally new types of typologies. To move away from our current habits we start the workgroup session by thinking about the restaurant business. There are a lot of places where you nowadays can buy your food for direct consumption (the restaurant, the cafetaria at work, the take-away pizza, the petrol station etc.). So we first ask you to think five minutes about an interesting typology (maximum 10 categories) for the restaurant business in your country. Write it down, and present them quickly in the workgroup.

After this moving to 'fantasyland' you are asked to make typologies for agriculture. Note down on a piece of paper a criterium for a typology and give three to five categories in this typology as an example (e.g. juridical - one man farm, limited company, cooperative) and stick the typology with tape to the wall. After 20 minutes discuss the results.

Group composition

Group A

Chair:	Michaela Lekesova
Reporter:	Verna Mitura
Members:	Øyvind Hansen
	Maija Puurunen
	Eva Øvren

Group B

Chair:	Frank Offermann
Reporter:	Kjell Staven
Members:	Hans Vrolijk
	Finn Andersen
	Martina Harvilikova

Group C

Chair: Torbjørn Haukås
Reporter: Hans-Hennig Sundermeier
Members: Mitko Kostov
Beat Meier
Anne Kinsella

Group D

Chair: Catherine Moreddu
Reporter: Ane Lyng
Members: Vesna Ilievska
Tomas Westling
An Van den Bossche

Results

Group A

Agri-environmental farms

- Conventional/organic (certified)
- Size (ha / #livestock/output)
- Type (pigs, grain,horticulture, agriculture, agri-tourism, non-agriculture)
- Share of non-agricultural output
- Full-time/part-time

Group B

Intensity of input

- Intensive
- Medium
- Extensive

Ownership

- Single owner
- Partnership
- Limited company
- Coöperation

Location

- Near city (big)
- Near city (small)
- Far from city

Objective for the farmer
- Maximize farm income
- Maximize return per hour of labour input
- Satisfaction with work

Group C

Farm size
- Land
- Livestock number
- Income
- Revenues
- Labour/no. of employees
- Quota
- Capacity
- Animal places
- Equipment

Business orientation
- Commercial (% of income)
- Subsistence (% of nutrition)

Production typology
- Labour allocated to products
- Income allocated to products
- Number of processing steps

Intensity of production
- Stocking density
- Mechanization (hp/ha)
- Yield (classes)
- Depreciation cattle/ha
- Labour/unit
- Grade of skilled labour
- Working capital/unit

Ecological orientation
- Ratio purchased inputs/total outputs
- Ratio home produced inputs/purchased inputs
- Energy balance: energy purchased/energy produced
- Mineral balance
- Biological indicators: number of species
- Use of pesticides

Group D

Customer oriented farms

- Food consumer
  - > 20% of sales via direct channels
- Users of rural space
  - Environmental services
    - Working hours on farm >20% 'non-production'
    - …% of hectares farmed extensively
    - …% of sales 'geographical indications or other'

Production oriented farms

- vertically integrated
  - >50% of gross sales is contract
- members of cooperatives
  - >80% of gross sales via cooperatives
- 'best offer'
  - >80% solo competitively

…*Undecided*

Workgroup Session 4
Comments on the handbook

Theme

The Handbook-project as introduced in this session by Catherine Moreddu can become a very usefull reference and guidance source. It is therefore important that it fits to the needs of the FADN / ARMS community. This 'fit' as a number of aspects:

- will the handbook deal with all the topics needed;
- will it address the relevant issues within these topics;
- will it come up with solutions for problems we currently face;
- will it come up with acceptable solutions for unharmonised issues.

In this workgroup session we will address these concerns. As not everybody has a detailed knowledge of the current handbook texts, we will start our discussion from the needs of the FADN/ARMS community. We do this by filling in the following table:

Issues that we expect to be discussed in the handbook	Potential solutions (plural!) for the issue

Groups are requested to fill in this table with e.g. 15 important issues. Use the first 10 minutes of the workgroup time to brainstorm individually on a blank piece of paper and then discuss the issues and put them in a joint table.

Group composition

Group A
Chair: An Van den Bossche
Reporter: Mitko Kostov
Members: Kjell Staven
Eva Øvren
Michaela Lekesova

Group B
Chair: Finn Andersen
Reporter: Verna Mitura
Members: Martina Harvilikova
Vesna Ilievska
Anne Kinsella

Group C

Chair:	Tomas Westling
Reporter:	Catherine Moreddu
Members:	Øyvind Hansen
	Torbjørn Haukås
	Hans Vrolijk

Group D

Chair:	Maija Puurunen
Reporter:	Beat Meier
Members:	Ane Lyng
	Hans-Hennig Sundermeier
	Frank Offermann

Results

Group A

Background

- At the beginning of each chapter
- Why is it written?
- What data are we going to collect?
- Data sources (surveys, registers) and methodologies
- Analyses/calculations
- Way of collecting data

Definitions of keywords

- At the beginning of each chapter, or…
- One chapter with all the definitions (household, income)

Ex. rural household
urban household

Complete explanations

- Not references to other papers

Topics

- Data on rural households, livelihood and well-being
  - Economic data
  - Social data
- Subsidies
- Indicators of successfully carried out work

Group B

- Consistent definitions
  - Farm income, costs, rural household, farm household, agriculture, size of farm (typology, econmic groups, land, animal units), rural vs urban, % of resource use (measure), organic farms, well-being
- Is well-being quantitative of qualitative
  - Quality of life index
  - Farm/food safety
  - Farm family well-being vs rural community well-being
- Parts to report published in sections
- Strange title
- Business plan/investment guidelines for farmers
- Summary of indications
- What is the objective of that report?
- How many languages for translations?

Group C

- Information
  - Clear definitions in existing agricultural and other data sources
  - Design of data sources (sample, observations, collection of information)
  - Objectives
  - Critical analysis of differences between data sources
  - Limitations/interpretation of statistics
  - Best practices (bad ones?)
- Interactions
  - User-friendly (internet search)
  - Reactivity to make the handbook evolve (suggest changes)

Group D

- Definition of:
  - Household (rural)
    - Ownership, management, employment, legal forms
    - Consumer units
  - Livelihood
  - Well-being
  - Rural development
- Overall objective target group
- Rural/urban criteria
- Guidelines for comparing groups
- Well-being indicators
  - Health
  - Age structure/life expectancy

    - Crime/security
    - Employment
    - Education
    - Infrastructure (transport, etc.)
    - Disposable income/purchasing power
    - Working hours/revenue
    - Wealth
    - Investment growth
- Applications/examples/references
- Cultural aspects/differences
- Checklists
- Good summary

Comments on handbook on rural household, livelihood and well-being

Krijn J. Poppe, LEI

Introduction

This paper provides the authors of the Handbook some feedback from managers and users of micro-economic datasets. The PACIOLI network (see www.pacioli.org) gathers every year to discuss innovation topics for micro economic datasets by bringing together managers and data users. This author is coordinator of the network.

Based on an exchange of e-mails between Jan Karlsson and me, we decided to use one of the sessions in the 2005 workshop (early June in Norway) on the handbook. The workshop was attented by about 20 persons from Europe (from Macedonia to Norway with some Nordic bias) and Canada. The handbook project was introduced by Catherine Moreddu (OECD). Participants were provided with the draft versions of the content of the handbook and the chapters 9 to 11 as available at the end of May on the UNECE Website (unfortunately this were the chapters as discussed in the session at Wye College, so several of the comments given below will have been discussed also at Wye). Participants were asked after this introduction to discuss the handbook based on instructions as given above. We offered also the possibility to send in comments before June 25.

Results discussions in Pacioli

The results of the discussions are given above. Analysing these results of four discussion groups, the following conclusions can be drawn:

- an implicit positive attitude to the project of the Handbook;
- a need to explain the objective of the handbook including target groups etc.;
- a wish to have really an authorative handbook, not a collection of papers by different authors. This asks for good summaries, good and consistent definitions, a good index, references only to link with original work, not as a escape to skip an item, etc.;
- a wish to have guidance on types of data sources (surveys, accounts, administrative data) and related statistical issues;
- attention to the limitations of concepts and statistics, including (international) comparability;
- an interest to have best practices reported;
- interactive availability, perhaps to be coupled with an open source maintenance structure.

Remarks on the draft text

From the FADN community three important remarks on the content of the handbook can be made:

- the FADN itself is not very much discussed, compared to e.g. ARMS, the ISMEA methodology or reports from individual countries like Denmark or Sweden. This is especially clear from the content of chapter XIII. The background can be the composition of the project team or the fact that FADN does not gather much information on non-agricultural data. However this should then be made clear and it leaves out experiences in FADN (accounting methodology, thresholds, farm typology, definitons of indicators on agricultural income) that could be usefull for others. Perhaps this point can be solved by asking Eurostat to liaise with DG-Agri or to ask the PACIOLI group (de facto perhaps the LEI) to contribute to chapter XIIII;
- there is not much guidance on accounting methodology. Nearly all chapters are assuming a survey approach (where the data in the survey might be taken from a tax accounting report or commercial accounting package in the farm) or take the accounting issues for granted. This means that a lot of know how on e.g. valuation issues (historical costs, replacement costs, fair value, valuation of biological assets like dairy cows or plantations) is not even refered to. It is striking that e.g. nowhere a reference is made to the IFRS (international financial reporting standards, that include IAS 41 on Agriculture and is now in the process of being adopted in many countries). The fact that tax accounting rules are sometimes heavily deviating from academic accounting methodology or IFRS and are internationally sometimes difficult to compare (e.g. valuations of land and quota) is also not touched upon;
- the guidance in the Handbook on statistical issues (panel techniques, farm selection, rotating panels, non-response handling, poststratification, linking microdata with Farm Structure Surveys/Agricultural census or Registers etc.) could be improved.

More detailed remarks:

1. chapter IX point 13: the last sentence on the more then one household per farm is an important issue that should be elaborated upon. In the Pacioli-12 report there is a paper by Poppe et al for a SFER conference that gives extensive discussion on the issue how to record data on a holding with different households, different legal structures and different locations.
2. IX point 23: by focussing on land as a definiton of agriculture intensive operations in e.g. pigs and poultry and glasshouse horticulture are overlooked. The favourite definition of agriculture for accountants is in IAS 41: Agriculture activity is the management by an enterprise of the biological transformation of biological assets (living animial or plant) - for sale, into agricultural produce or into additional biological assets.
3. IX # 31: here the issue of standardisation/averaging income over e.g. three years should be stressed. Some farmers have negative incomes in some years and would then drop out of the agricultural sector. (resulting in high incomes for remaining farmers and uncomparability of statistics).

4. X # 5. It could also be made clear that income and wealth are related and that if wealth exists, means testing for income support can be an issue.
5. X # 14: is double with chapter IX.
6. X # 15 'it assumes that the farm can be seperated from households'. This is not needed if you are interested in household wealth. Then you just measure total wealth including farm assets. And perhaps you need to separate between two households. It is only when you want to decompose household weatlh into farm and non-farm assets that separation is needed (and problematic for loans). [this comes back in points 21, 22 and others).
7. X # 16: should we not include in e.g. the case of East Germany all the unemployed persons that rent out 5 ha to the private owners of the former LPG farm?
8. X # 30: should we refer to all the literature on inflation accounting (Sandilands report etc.), especially for some developping countries. Another issue is that captial gains also play a role in mutual investment funds that do not pay out a dividend. Dutch tax accounting assumes a 4% yield each year that is taxed, be it a real capital gain or a cash income or not. Such a method can help to make data between households comparable.
9. X # 35: IFRS rules state that unrealised capital gains in investment funds (shares etc.) are income.
10. IX #9: pension and social security systems differ in favour of non-agricultural workers and agr. Employees. Tax systems often differ in favour of businessmen in general and agriculture especially. This makes pre-tax income between farmers and other groups hard to compare if livelihood or well being is the objective.
11. IX # 13: pay attention to institutional units in CEEC ?

Workgroup Session 5
Recommendations for FADNs on data gathering on future farmers

Theme

Farm succession is an important topic. Not only for the farmers and their successors, but also for society: a lot of the rural development policies are put in place to keep the country side populated and an attractive place to live. From the papers presented in this session we learn that farm succession is a topic that has accountancy and advisory aspects. FADNs can collect data on this issue. Data can be collected on a number of related issues:

- Retirement and retirement planning: what are the plans of the current farmer.
- Viability of the farm: given the size, type and location of the farm, is it likely that the farm will be handed over to a successor or is it more likely that sooner or later the production will be taken over by another (already existing) farm, or will the land be abandoned.
- Availability of successor: is a successor in sight, and is she/he already working on the farm?
- Government involvement: is the farm using governmental support (subsidies, tax breaks, special juridical forms) in the succession process and is this support effective.

We discuss the usefullness of FADNs in collection data on these issues by developing five good questions that can be directly implemented in FADN surveys. Questions therefore should be clear (or even have a multiple-choice character). Groups are free to use any brainstorming or discussing method to develop the questions.

Group composition

Group A *Retirement and retirement planning*

Chair:	Vesna Ilievska
Reporter:	Torbjørn Haukås
Members:	Beat Meier
	An Van den Bossche
	Frank Offermann

Group B *Viability of the farm*

Chair:	Anne Kinsella
Reporter:	Øyvind Hansen
Members:	Catherine Moreddu
	Ane Lyng
	Verna Mitura

Group C *Availability of successor*

Chair: Hans Vrolijk
Reporter: Eva Øvren
Members: Finn Andersen
Michaela Lekesova
Mitko Kostov

Group D *Government involvement*

Chair: Hans-Hennig Sundermeier
Reporter: Maija Puurunen
Members: Kjell Staven
Tomas Westling
Martina Harvilikova

Group A

Retirement and retirement planning

- At what age do you plan to retire?
  - Age
  - Don't know
- Do you plan to retire?
  - Next five years
  - 5-10 years
  - I don't plan to retire the next 10 years
- Do hou have free lodging?
- Do you still be working on the farm after the retirement?
  - Yes, ... hours
  - No
- What are the sources of income after retirement?
  Rank alternatives
  - Wages
  - Pension
  - Interests
  - Savings
  - Rented assets
  - Transfers from family

Group B

(Future) Viability of the farm

- Farm fregmentation (how viable is the farm)
  - Number of plots
  - Distance from each other
- Location of farm
  - Physical aspect
  - Distance from urban centre
  - Zoning
- Number of children
  - Age
  - Gender
  - Education - agricultural qualifications
  - Participate in farm work/decision making
- Legal constraints
  - Inheritance taxes
  - Retirement schemes
  - Splitting holding
- Off-farm job opportunities
  - Work part-time/full-time on farm

Group C

Availability of successor

- Is there a potential successor?
- Is the succession formally arranged?
- Is the successor a relative?
- Does the successor already work on the farm?
- What educational background does the successor have?
- Other topics:
    - Ages
    - Experience
    - Spouces
    - Attitude of spouces
    - …

Group D

Government involvement

- Questionaire for the retirement plans to the FADN-farmers
    - Retirement fime
    - Early retirement programme
    - Is there a successor appointed?
    - Does the farmer participate in an early retirement programme?
- What are the financing and income sources for the successor programme?
- Will the farmer continue farming with the successor?
    - What is the involvement of the older farmer in operating and decision making on the farm?
- Installment issues

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